

JPRS 76760

5 November 1980

China Report

ECONOMIC AFFAIRS

No. 95



FOREIGN BROADCAST INFORMATION SERVICE

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NATIONAL POLICY AND ISSUES

JOURNAL DISCUSSES OWNERSHIP OF MEANS OF PRODUCTION

HK140915 Beijing JINGJI YANJIU in Chinese No 9, 20 Sep 80 pp 21-22, 33

[Article by Yuan Peishu [5913 1014 2885]: "On Ownership of the Means of Production Not Belonging Within the Scope of Production Relations"; passages enclosed in slantlines printed in boldface]

[Text] In the current discussion on production relations being an objective of political economics in economic academic circles, many comrades ascertain that ownership of the means of production is a decisive factor in the production relations. Is ownership of the means of production a decisive factor in production relations? Does it belong to the scope of the production relations and is it an objective of political economic study?

The following is a presentation of my views:

/1. Ownership of the Means of Production Is Not a Decisive Factor in Production Relations/

I think that ownership of the means of production is not a decisive factor in production relations. The main reasons are as follows:

(1) Seen from the content of the concept of the nature of production relations, the view that ownership of the means of production determines the nature of production relations is based on the prerequisite of the misunderstanding of the question as to what does the nature of production relations refer to. Well, what does the nature of production relations refer to? Does it refer to the private nature or public nature of a certain kind of production relations? Does it mean that a certain kind of production is beneficial to this class or to that class? Does it mean that a certain production relation is fair or unfair, rational or irrational? I think that this is an incorrect understanding of the nature of production relations. At least it is incomplete. The nature of production relations should refer to whether the production relations conform to the productive forces or not, and whether they promote or restrain the development of productive forces. The nature of production relations should be judged by the relation between productive forces and production relations. Only in this way can we correctly illustrate the role and evolution of a certain production relation in history and judge correctly whether the production relations are advanced, backward or reactionary.

Otherwise, on what basis can we claim that the capitalist production relations on the ascent are progressive when the means of production remain in the hands of the bourgeoisie and seek profits for the bourgeoisie all the time? And on what basis can we say that capitalism, developed to imperialism is partially degenerated and becomes decadent?

(2) The development of production relations cannot be determined by ownership of the means of production. If we admit that the ownership of the means of production determines the development of the production relations, an ironclad logical force will inevitably push people constantly toward "incessant transition" and "transition into poverty" because as long as we change the ownership of the means of production, we can determine the development of the production relations. Which good and honest person does not long for a higher form of production relations? What consequences will this lead to? The disaster caused by the "gang of four" provides a historical answer through practice.

(3) Seen from the system of production relations in a certain social form, the view that ownership of the means of production determines the nature of production relations will inevitably sever the internal organic ties and the inter-relationship coexisting in the various production relations in a certain form of society. Marx said: "In all social forms, there is a certain kind of production which dominates the position and influences all forms of production. Consequently, its relation also dominates the position and influences all other relations. This is a light which shines on all. All other colors are hidden by it and it changes the characteristics of all these other colors... Just as in ancient society and feudal society, farming was in a dominant position. There, industry, industrial organizations and the correspondent industrial form of ownership were more or less tinted with the nature of land ownership... In the middle ages, even capital--so long as it was not pure monetary capital--in the form of traditional manual tools, etc. All carried this nature of land ownership." ("Selected Works of Marx and Engels," "Introduction To Critique of Political Economy," vol 2, pp 109-110) This passage is very clear and all other explanations are superfluous. Just one example is cited: Why do we say that the domestic sideline production of members of people's communes in the countryside in our country and the private plots supplemented socialist economy and were distinguished in their nature from small production before the formation of cooperatives? Seen from the ownership of the means of production, this part of the economy has not undergone any change in nature.

(4) The emergence and nature of the ownership of a certain means of production itself have to be illustrated by the production relations on the other hand.

The emergence and formation of any means of production are not determined by the subjective will and action of people, but are the outcome of the development of a certain production relation. Marx made a detailed analysis of this point in the "Introduction to the Critique of Political Economy." ("Selected Works of Marx and Engels," "Introduction to the Critique of Political Economy," vol 2, pp 99-100) Marx also pointed out clearly: "The ownership of capital is not formed just because the owner possesses the means of production and means of

livelihood. Capital is formed only when the owner of the means of production and means of livelihood find free workers in the marketplace who are willing to sell their labor and this condition alone is incorporated in world history." (Marx: "Capital," People's Publishing House, 1975 edition, vol 1, p 193)

The historical nature of the ownership of any means of production cannot be determined by the question of who grasps the means of production but can only be scientifically illustrated from its production relations. Marx said: "The correctness of the ownership of land, just like the correctness of all other types of ownership under a certain form of production, must be illustrated by the temporary historical inevitability inherent in the form of production itself and thus has to be illustrated by the temporary historical inevitability of the production relations and relations of exchange thus produced." (Marx: "Capital," vol 3, p 702)

/II. Means of Production Do Not Belong to the Scope of Production Relations and Is Not an Objective of Political Economics/

The so-called ownership of the means of production is still strictly restricted to the meaning of "who owns" and "who distributes" the means of production, which is the ownership of the means of production. To clarify whether the ownership of the means of production in this sense is the objective of political economics, I feel that we must first clearly distinguish between two questions: First, distinguish between the various specific meanings of the scope of ownership used by Marx on different occasions. Second, distinguish between the ownership of the means of production itself and the ownership of the means of production realized in the economic process.

What I have learned from my studies is that Marx gave ownership three different meanings. The first is in the most abstract meaning, that is ownership in the sense of possession of nature by producers. Second, is who owns the means of production or the distribution of conditions of production among people on a social scale. It is normally described as ownership of the means of production and ownership in this sense is specified as a "condition" in production and the "basis" for the form of production. Third, ownership is taken as the sum total and in the sense of production relations. Marx's relevant discussions on the second and third sense of the scope of ownership have been quoted many times by people holding different viewpoints in this current discussion. They cling to their own views and argue constantly. The first meaning of ownership tends to be used by people to fit their own requirements and is mixed with the other two meanings.

I think that the key link in the question does not lie in the differentiation between the three different meanings of ownership. What is more important is which meaning should be an objective of the study of political economics. Therefore, it is necessary to refer to the second question, to distinguish between the ownership of the means of production from the economic realization process or actual form of the ownership of means of production, which is to distinguish between the second meaning and third meaning of ownership. I think that it is only possible to include the third meaning of ownership

as an objective of study of political economics, which is in the sense of the sum total of the production relations. The reasons are:

(1) The first meaning of ownership, which is the possession of nature by producers, is the synonym for production and cannot be taken as the objective of study of political economics. This is evident. Why cannot the second meaning of ownership (that is who owns the means of production) be taken as the objective of study of political economics? The target of study of political economics is the production relation. This point is recognized by all. The production relations, no matter whether understood in a narrow sense or broad sense, generally refer to the interrelation between people in the process of production. Engels clearly pointed out, "That economics study is /not/ material but human relationships, which are in the final analysis, relationships between classes. However, these relations are bound to be /integrated with material/ and /manifested as material/." (Engels: "Selected Works of Marx and Engels," "Critique of Political Economy," vol 2, p 123) We must master two essential points here: That economics study is neither material nor the relationship between human beings and material, but the relationship between people. The relationship between people which is "integrated with material and manifested as material" and the relations between people and between human beings and material are two basically different things. Ownership in the second meaning refers to who owns the means of production. What it manifests is precisely the relationship between the owner and the owned, which is the relationship between human beings and material. The relationship between people and material revealed in scope in this sense can completely exclude the relationship between people in the course of production and can exist outside the production process. For example, what is manifested in land ownership is only the exclusive monopoly of a certain part of the globe by individuals or collectives. Scope in this sense only shows the exclusive relationship between the owner and the land. Here it precisely takes the exclusion of all nonowners as its prerequisite. In other words, it precisely takes the exclusion of the relations between people as its prerequisite. Otherwise, land ownership is an empty word. Engels explained this profoundly: "Political economy starts from /commodity/,... the product entered into the exchange is commodity. However, it has become a commodity only because in this /material/ and in this product, the /relationship/ between two individuals or two communes, is integrated; that is, the relationship between the producer and the consumer. Here, the two are no longer integrated in the same person." (Marx and Engels: "Selected Works of Marx and Engels," "Critique of Political Economy," vol 2, p 123) The starting point of political economy is commodity. Why? Because the material of commodity has already integrated the relationship between two people or two communes. This is to say that it has already embodied human relationships. [HK140919] Before this starting point, outside the sphere of exchange or circulation, all products undoubtedly have owners. But there, the owner only has a relationship with his own products and does not come into contact with other producers. There is no relationship between people. Economics then cannot start with this point. It can thus be seen that the starting point of economics should be the same as the starting point of the relationship between people. Before the beginning of the relationship between people, for example,

in places with the ownership of the means of production, although the relationship between the owner and the material owned exists, there is no relationship between the owner and other people. Therefore, it should be excluded from the scope of interpersonal relationships studied in political economy. Once the owner has developed a relationship with other people through the material owned and includes the material which he owns in production as a key element in production, this already marks the beginning of the production process and the relationship between people has developed, or the owner sells the material owned by him and develops a kind of relationship with others: However, all this belongs to the economic realization of the process of ownership, or it can be called the actual form of ownership in economic relationships. This is to say that it has already exceeded the scope of the second meaning of ownership and belongs to the third meaning of ownership. Thus, it can be seen that ownership of the means of production in the second meaning does not belong in the subject of political economics study. What political economics should include is only the actual form of the ownership of the means of production, which is the third meaning of ownership.

(2) Marx pointed out: "Political economics does not comprise the sum total of the /relations of properties/ in their legal manifestation, that is as the /relations of purpose/, but comprises them in their actual form, which is the /relation of production/." ("Selected Works of Marx and Engels," "On Proudhon," vol 2, p 142) In current discussion, people tend to get entangled in the problem of whether ownership is a legal form or legal terminology, and they ascertain whether ownership is the essential element in the objective study of economics on the basis of their different understandings of this problem. I think that the core of the question does not lie here, but lies in which sense of relations of ownership belongs to the target of study in economics. Marx said very clearly what political economics should include is not the ownership of the means of production itself but the "actual form" of the ownership of the production relations itself, which is ownership in the sense of the sum total of production relations as normally described by people. Otherwise, how can we explain that political economics includes the relations of property (also translated as the relations of ownership) in "their actual form, which is the relations of production?" We can only obtain the scope of the relations of ownership from the sum total of the analysis of all the theories in the whole production process in society. Marx said: "/Private ownership/ is not a simple relationship and is definitely not any abstract concept or principle, but is the sum total of the /bourgeois/ relations of production." (Marx and Engels: "Selected Works of Marx and Engels," "Ethical Criticism and Critical Ethics," vol 1, p 191) This means that what should be included as a target of study in political economics is the scope of ownership in the sense of total production relations. The ownership of the means of production in the sense of the ownership of the means of production does not belong to the scope of production relations and is not a target of study in political economics.

(The manuscript was received in May 1980) [Editor's note]

THEORY OF SOCIAL PRODUCTION RELATIONS DISCUSSED

Xi'an XIBEI DAXUE XUEBAO: SHEHUI KEXUE BAN [NORTHWEST UNIVERSITY JOURNAL (SOCIAL SCIENCE EDITION)] in Chinese No 1, Feb 80 pp 26-32, 118

[Article by Zhu Ling [2612 3781]: "The Object of Socialist Political Economy"]

[Text] The object of study is the first problem to be solved in the pursuit of any academic discipline. Now, our economists are discussing anew the object of socialist political economic study. No doubt this is vital to the establishment, development, and perfection of the socialist political economy. During the progress of the discussions, many scholars have prepared written materials to criticize the traditionally held theory of the "trichotomy" of production relations. But is the subject of socialist production relations the only object or just one aspect of the pursuit? What do socialist production relations imply? What are the relative positions of the internal relationships within socialist production relations? One often finds too many conflicting answers to these questions, and sometimes none at all. This author would like to take the liberty to offer his superficial observations for public comment and criticism.

I. What the Research Object of Political Economy Is

Viewed theoretically, the process of social production is the production and reproduction of material means of subsistence for mankind. It is also the process by which social production relations (broad production relations) or economic relations are produced and reproduced. The former denotes the process of direct production, exchange, distribution, and consumption (a process by which mankind reproduces itself). The latter covers production relations (strict), exchange relations, distribution relations, and consumption relations. The latter are the research object of political economy. That is why Marx pointed out emphatically: "It takes imagination rather than a microscope and chemical reactants to analyze economic formations."¹ Capital, which controls production relations in a capitalist society, is the research object of the political economy of the capitalist society, as delineated by Marx when he overhauled the science of political economy.² This is borne out by the fact that he entitled his masterpiece on political economy "Das Kapital." Marx disclosed in Volume 1 of this book the strict production relations of capital--the relations between capital and labor. In Volume 2 he dealt with the exchange relations in capital circulation between industrial capitalists. In analyzing the total capitalist production process, he revealed in Volume 3 the distribution relations of capital and how relations between capital and capital overshadow relations between capital and labor. He

provided a full exposition on the different forms which capital takes in various areas of social production and the various aspects of the production relations in a capitalist society, as seen from the different links of the capitalist production process. The research object of a particular academic discipline determines the method and scope of study. Since the research object of political economy is production relations, the research method should be an abstraction which covers the process of social production and reproduction of material goods.

Social production relations are formed by people in the process of the production of material goods. There is no other way to discuss social production relations apart from this process. For a long time, students of theoretical political economy have claimed that Stalin's "trichotomy" has simplified the socialist production relations. Instead of extracting economic relations from the real economic process, they confine themselves in the merry-go-round of the ownership of the means of production and the relations between people, or simply let conclusions drawn from mutually supporting relations between particular comrades take the place of research into the social production relations in socialist societies. This kind of "production relation" is not at all the kind of lively objective relations of people in the process of real economic operations. It is simply political jargon. However, in rectifying this abuse, some comrades have introduced to the research object of political economy several other factors such as productivity, and they treat social production relations as only one phase of the object.³ For instance, some are in favor of including productivity in the object; they claim that political economy should deal with the contradictions between productivity and production relations. In reality, the production relations mentioned in this connection are strict production relations and not the social production relations. They have actually narrowed down the scope of the research object of political economy. The elements of productivity (workers as the subjective element, and means of production as the objective element) are also elements of production. The development of productivity is a direct production process--the unity of labor and value represented by commodity. The latter gives the whole process specific social characteristics of a specific historical period, determines the nature of certain phases of social production relations and their internal relations, but does not equal the totality of social production relations. Productivity works directly on strict production relations but must go through strict production to work on the remaining links of social production relations. The production relations mentioned in the above view represent only one phase of social production relations, or the object of Volume 1 of "Das Kapital," unlike what some comrades have in mind, is only one aspect of the object of study. When Marx discussed absolute surplus value, he regarded the relations emerging out of the direct production process as the formal subordination of labor to capital, assuming productivity to remain constant. In his discussion of relative surplus value, assuming productivity to be variable, he regarded the relations thus revealed as the substantive subordination of labor to capital. Marx treated the three stages of the development of productivity in capitalist society as three stages of the development of productivity in capitalist society as three measures for producing relative surplus value. That is to say, capital completely dominates labor in the process of direct production in which social productivity becomes capitalist productivity, a force to oppress the workers--the antithesis of labor. His study on the whole centers around the relations between capital (the material embodiment of the capitalists) and labor (the

material embodiment of the hired workers). That is, the object is "limited to the production relations between members of society"⁴ and nothing else. Taking the discussion on production of surplus value in "Das Kapital" as proof, some comrades, who do not see the difference between the object of study on the one hand and the premise and scope of study on the other, claim that productivity is also a research object of political economy.

There are still others who claim that the relationship between man and nature is a phase of production relations and ought to be included as a research object of political economy.⁵ This expands the concept of social production relations. The production relations which form the object of political economy stand for historically defined relations between people in the economic process--i.e., their specific social economic relations. Although these relations are inevitably tied to the relationship between man and nature, the latter, the embodiment of all forms of social relations, cannot be the research object of political economy. Its position in this branch of academic discipline is explained by Marx in his discussion of the process of labor and the process of creating value: In discussing the process of labor, we need not bring up the relationship between workers and other forms of labor, because the process of labor requires only man and his labor, on the one hand, and nature and its materials on the other."⁶

Some people are likely to say that the law of the emergence, development, and demise of capitalist social production relations expounded in "Das Kapital" is meant to provide the proletarian revolution with a theoretical weapon, while the law of socialist economic movement revealed in socialist political economy provides a theoretical basis for the actual practice of socialism. So the object of the two ought to be different. Apparently believing that political economy covers all branches of economic science, they try to include as parts of the research object of political economy such subjects of applied economics as the allocation of productive forces and financial and business management. Other comrades claim that the object of political economy is a total framework of all forms of production,⁷ while the object of applied economics covers only parts of that total framework. Personally, I think the differences between that part of political economy dealing with capitalism and that dealing with socialism spring from the historical differences in the social production relations rather than from the scope of the object of study. The socialist economy in action must continually readjust the relations between people, the relations between people and materials, and the relations between the various economic organs, so as to insure coordinated, speedy development. It needs all branches of economic science to fathom from different directions the law of socialist economic operations, because their approaches are different even though they touch upon identical areas of the economy. This explains the mutual relations of things and the overlapping of different academic disciplines, but it does not obliterate the differences in their objects of study. Although the scope of political economy, a basic theoretical discipline of the science of economics, is broader than any other branch of economics, it cannot cover or take the place of all economic sciences. Its relationship with the latter is not one between the whole and its parts. The mission of political economy is to study the social aspect of economic operations from the vantage point of the relations between people in the economic process and to discover the law of social production relations from social economic movement so as to provide a theoretical basis for voluntary adjustment of the relations between people in real economic practice. Like other economic sciences, it has its own

object of study. If the object changes, it will no longer be the political economy it has been.

II. Consumption Relations Are One Phase of Social Production Relations

Most comrades have not yet touched upon consumption relations as a phase of social production relations, the research object of political economy. A few who have discussed it treat such relations as part of the economics of consumption, while others list it alongside the other three relationships. They have not assigned it a suitable position in the socialist social production relations. This is due to both theoretical and historical reasons.

From the standpoint of ideology and theory, socialist political economy is a direct successor to Marxist economic theory. Some comrades who have read Marx's "Introduction to 'Critique of Political Economy'" jump to the conclusion that Marx excluded consumption relations from the research object of political economy. The following quotation may help clarify this confusion: "Production, distribution, exchange, and consumption form a typical syllogism. Production is the major premise, distribution and exchange are the minor premise, and consumption is the particular or conclusion. They are closely related, though the relationship is quite superficial. While production is determined by general natural law, distribution is determined by accidental social conditions and may more or less enhance production. Exchange, a form of social movement, comes between the two. Consumption is regarded as the end result as well as the concluding act to achieve the final objective. It does not fall within the scope of economics, except that it may turn again into a starting point and lead to a repetition of the whole process."⁸ Judging by this wording, it is not too difficult to see that Marx was narrating the views of someone else and not expounding his own views. If we read this part of the "Introduction" carefully, we will see even more clearly that in his discussion of the mutual relations of the four links, Marx was criticizing the syllogisms of such vulgar economists as Mueller. He did not endorse the concept.

Moreover, Marx's own works reflect precisely the object of study defined by various economists. Although he did not define the implications of social production relations, "Das Kapital" contains an undisputed exposition of the subject. In his examination of the process of direct production, he considered circulation to be one of the factors. When he came to circulation, production was regarded as one of the factors. Both production and circulation were factors in his exposition of distribution. Individual personal consumption was considered a factor in the reproduction process. Consumption by the working class, however, was treated as a link in the direct production process. In "Das Kapital," strict production and exchange relations are the vertical and horizontal coordinates of capitalist production relations, with distribution relations staying behind the two. Consumption relations built on antagonist distribution relations play only a subservient position in strict production relations. The fact that the individual personal consumption of the workers is regarded as an important factor in the production and reproduction of capital is because individual personal consumption by the working class transforms the means of subsistence that is given to labor by capital into labor which capital may exploit anew. The production and reproduction of labor form the capitalists' indispensable means of production."⁹ Individual consumption by the capitalists is also regarded productive, because the capitalist

who becomes personified capital in direct production gains the commanding and managing authority in the capitalist production process and becomes the captain of a big industry. If there were no capitalists, there would not be capitalist production. Marx therefore did not exclude consumption relations from social production relations. He used the theoretical structure of "Das Kapital" to reflect the dialectical unity of the various phases of capitalist social production relations. Thus, when we inherit the achievement of our predecessors, we must thoroughly understand their system of reasoning and must not jump to simplistic conclusions on the strength of a few sketchy remarks.

Furthermore, inheriting and drawing lessons from Marxism does not mean copying that ideology indiscriminately. Political economy is a science of history, and our study must be based on actual economic operations. In every society, production involves four links, even though their mutual relations differ in different social production processes. Similarly, the relative positions of the various phases of social production relations are not identical. The key points of study in political economy which reflect these changes will change in theoretical structure accordingly. Engels once cited the vast difference between the political economy of Tierra del Fuego and that of England to illustrate this point.¹⁰ The history of political economy shows that in the embryonic stage of capitalism, when society was dominated by commercial capitalists, commercial capital, the earliest form of capital, was used for the exchange of products that the capitalists had developed. So the mercantilists were interested in studying the exchange of commodities and the ensuing exchange relations. Later, when industrial capitalists became dominant, the merchants became both merchants and industrialists and launched large-scale production to enhance commerce. Thus, industrial capital replaced commercial capital to dominate the scene. These tremendous changes in objective economic conditions led the classical political economists to switch their attention from circulation to production, around which all theories revolved. As capitalist production developed, the manufacture of commodities became the most popular form of capitalist production. When capitalist production and exchange became separate and independent, Marx was interested in the unity of opposites in the relations between production and exchange. This, as mentioned above, provided the structure of "Das Kapital." The structure of this system of political economy is based on the four links of social production and the theoretical manifestation of the internal structure of social production relations. Since the latter are changes brought about by historical development, the former cannot possibly remain constant and immutable. The difference between the socialist economic process and relations on the one hand and the capitalist economic process and relations on the other is shown in the structural differences between these two systems of political economy, their theoretical manifestations. Consequently, to have a socialist political economy modeled entirely after "Das Kapital" goes against objective reality and historical materialism. The position of consumption by the working class in the socialist economic process is completely different from that under capitalism or even in any preceding economic period. The most important reason some comrades excluded consumption from the research object of political economy is that they overlooked the reality of these changes.

While consumption for production is a production process, individual consumption is what consumption really means. Marx explained very clearly in his "Introduction" the role of consumption in the social production process and in the relations

of the other three links. Now I would like to discuss the unique position of consumption by the individuals in the social economic process. First of all, a socialist society is one in which the workers are the masters and labor replaces capital as the controlling economic force. The individual consumption by the working class is not only a factor in production and reproduction but also the very purpose of social production. This is due to a dissimilation of the historical nature of the social production process. To produce for subsistence is a human instinct. In a primitive society, production is for consumption by the workers themselves. In a slave and feudal society, production is for the enjoyment of the ruling class, while the need of the workers is not a factor to be considered in producing for consumption. In a capitalist society, surplus value is the primary objective and motivating force of production. Under socialism, wherein the workers, the masters of society, have gained control over the management of production, the purpose of production returns to its original meaning as it reaches a higher level of development. It meets not only the consumers' need for a means of subsistence but also their need for personal development and enjoyment. This is meant "to insure that all members of society can subsist and develop their faculties freely."¹¹ Moreover, individual consumption is the economic motivating force of production. The reason is quite simple. Since labor is only a means for making a living, the workers cannot enjoy it as part of their own physical or spiritual activities. Consequently, man works hard in the hope of raising continually the level of his material and cultural consumption. Of course, political-ideological education can arouse the enthusiasm of the workers to a certain extent, but that is not economically inevitable and cannot replace the vital role of consumption. Only individual consumption will stimulate socialist production. It must be made clear that the purpose of socialist social production is to satisfy the consumption needs of the whole body of workers. Individuals work in the hope of raising continually the level of individual consumption by every worker. The primary objective of production by an enterprise is to earn profit, rather than to meet the consumption requirement of the workers, because [the enterprise] is an independent producer of commodities. Socialist production of commodities must use the vehicle of value to realize the growth of social wealth, to provide society with the commodities it has produced, and to insure indirectly that the consumption need of the worker is well met. So the purpose of production by society, by enterprises, and by individuals represents a unity of differences. This unity and these differences are the unity of antithesis of the three factors. The mission of political economy is to expose the law of these relations and meaningfully apply various economic mechanisms to regulate the relations between the three in order to enable social production to proceed in the midst of these contradictions.

It may be seen from the unique position of consumption as a link in the socialist social production process that these consumption relations are no longer strict production relations. They form an independent phase of socialist social production relations. However, it does not stand on a par with the other three phases. The mutual relations of the various phases included in socialist social production relations are dialectical. Their unique formations demonstrate the basic difference between socialist social production relations and other social production relations.

III. The Connotations of Socialist Social Production Relations

The socialist production process includes not only the manufacture of products but also production exchanges--i.e., the exchange of commodities used as means of production. First, the stages through which an object of labor becomes ready for consumption by individuals are all parts of the production process. The exchange commodity used by the first sector as a means of production in reproduction will continually crisscross between different parts of the production site. It may also be used by the second sector to manufacture consumer goods. "The exchange in this context represents production activities."¹² Second, under socialist planned production, the link between the exchange of commodities used as the means of production and production itself will become increasingly closer, and the two opposites of unity under capitalism will eventually merge under socialism, as public ownership develops and the degree of socialization increases. When socialist production engages in producing commercial commodities, the products must be exchanged as commodities and should not be used as ration in kind. But this is not meant to reject planned production. In producing means of production on contractual plans based on objective economic conditions provided by market survey, the difficulties involved will not be as "shocking" as under capitalism. A distinctive element separating commodity production under socialism from that under other social systems is the fact that planned production is practiced by individual enterprises as well as by the whole society. Planned production, however, does not mean production by subjective decree. The problems that have plagued our planned production have arisen whenever it is not run according to objective economic laws; they have not resulted from [any fault with] planned production as a system. [Planned production] is the objective requirement of socialized large-scale production and the subjective wish of the people. Today, the principal capitalist countries which already feel this requirement are applying planned controls to production. These attempts have been fruitful in certain economic sectors, such as agriculture. This shows that planned production and commodity production are not irreconcilable. But private ownership of production facilities under capitalism has been generally incompatible with these attempts. Planned production is necessary and possible only under socialism. The exchange of commodities used as means of production is highly developed, socialized, large-scale, planned production resembles the movement of semifinished products from one workshop to another of a single enterprise--just a link in the production exchange relations tied to direct production and production exchange, the two links in the production process, are but parts of socialist strict production.

The socialist distribution process denotes the distribution of the national income. Suppose the gross total output value is $\Sigma W = \Sigma x + \Sigma y + \Sigma m$; Σx (Σ Greek letter "sigma") then stands for the distribution of the social means of production executed by means of production exchange in the production process. The separation of Σy and Σm stands for the Grade I distribution of the national income. After their separation, Σy is distributed to the workers according to work, while m is distributed between the enterprises and the state. The distribution relations corresponding to the distribution processes represent another phase of socialist social production relations.

People often think that individual consumption under socialism is for the reproduction of the labor force rather than for the reproduction of mankind itself. This is not merely a matter of terminology. Under capitalism, the workers are treated as the subjective factor (labor force) of production instead of as human beings. Consequently, their individual consumption is a reproduction process of the labor force, a factor of production and reproduction, no matter whether it takes place within or outside factories or during production. Under socialism, the workers exist as human beings. They consume not only to subsist but also to develop fully their physical and intellectual faculties and to get full satisfaction from their material and spiritual enjoyment. Consumption of the essential means of subsistence may be regarded as being for the reproduction of labor force, while consumption of the means for individual development is extended reproduction of labor force. Consumption of the means of enjoyment is obviously not within the category of the reproduction of the labor force. Even though individual consumption under socialism covers the reproduction of the labor force, the two are not the same. To equate the two completely is to obliterate the historical difference between individual consumption under capitalism and that under socialism. Of course people of different social strata under socialism follow different consumption patterns. In a socialist system of commodity production, consumer goods are acquired through commodity exchange. That is to say, consumers must buy the goods they consume. The fact people satisfy their consumption needs through purchase tells the production sector "what to produce" and "how much to produce." Thus, the relations in the exchange of consumer goods are included in the consumption relations of the consumption link.

What are the positions and mutual relations of the various phases of socialist social production relations? Before discussing this subject, we must take a look at the arguments about "the form of ownership of the means of production" contained in Comrade Stalin's definition of production relations. "The form of ownership," which is the form of the distribution of production facilities, stands for the ownership and possession of the factors of production (objective factor--the means of production, subjective factor--the labor force.)¹³ The form of possession of the factors of production determines the form in which the means of production and labor combine. The latter delineates the social structure of different economic periods¹⁴ reveals the nature and form of production representing the economic structure of a given period.¹⁵ In his proposed definition of production relations, Comrade Stalin tried correctly to underscore their decisive role. But first, "the form of ownership" used for distributing production facilities covers one of the factors of production¹⁶ and does not cover all the relations in the process of direct production, which really include the former. So "the form of ownership" is not included in Engels' definition, which deals only with strict production relations. Comrade Stalin confused the concept by giving equal weight to "the form of ownership" and strict production relations. Second, what affects exchange, distribution, and consumption directly are strict production relations as a whole, and not just the form of ownership. In the past, people mistakenly separated form of ownership from social production relations and claimed, without studying the economic relations involved in the entire economic process, that it determines the whole content of social production relations. It is also a mistake to equate ownership relations with social production relations. This represents another extreme in trying to separate it from production relations.¹⁷ If ownership were only a legal matter, we could say there are enough real economic relations to

support the allegation. But such relations are not the broad production relations, i.e., social production relations; they represent the possession of the factors of production involved in the direct production process. For instance, the premise of the exchange of commodities between commodity producers in a capitalist society is that each recognizes the other as a private owner. The economic relations which determine these legal relations simply cannot cover the exchange relations involving the distribution of production facilities. Marx once pointed out: "Such distribution is part of the production process and determines the structure of production."¹⁸ (The quotation is underscored for emphasis.) Second, they use the following quotation from Marx's works to support their claim that ownership and production relations are synonymous: "In every historical period, different forms of ownership develop under completely different social relations. Consequently, to define capitalist ownership is simply to describe all the social relations of capitalist production."¹⁹ Actually, if the context of this exposition were examined closely, one would see that what Marx had discussed is the historical background of ownership and its inseparable connection with all that is contained in the social production relations. But he refused to regard ownership as an immutable abstract concept.

This author believes a comprehensive analysis of social production relations would be obstructed if the relations involved in the possession of the factors of production were removed from their original positions. Possession of the factors of production is the principal component of strict production relations; without this, production becomes an empty image, and the unique form in which the workers and the means of production combine would be inexplicable.²⁰ When we take the correct approach and study economic relations in the light of the actual social production process, we must not rule out the need to explore the relations in the possession of the factors of production just because someone else has proposed basing the study exclusively on the ownership of the means of production. In explaining the formation of the relations of capital as he studied the forms in which the workers and the means of production combine, Marx explained the changes in the relations of the possession of the factors of production.²¹ He used capital, hired labor, and land ownership as the basic economic categories to reflect these relations.²²

At the conclusion of the above discussion, let us go back to the mutual relations of the various phases of socialist social production relations. Like social production in general, socialist production "controls the antithetical rules of production as well as other factors." The form of production determines the form of distribution, just as the distribution of the factors of production determines the distribution of products. Under socialism, production and distribution determine the form and level of consumption by people of different social strata. On the other hand, as distribution and consumption stimulate production, consumption determines the scope and content of production. The level of people's consumption reflects precisely their position in the production process and the conditions of distribution between various social strata. The former is measured by the latter. Consumption relations under socialism represent the other side of strict production and distribution relations.

A clear understanding of socialist social production relations is only a general framework of the principles of socialist political economy founded on objective economic operations. The details of this framework, the specific content of every phase of socialist social production relations, rests on the scientific

derivation of economic categories from the economic phenomena obtained through studies of the actual operations of the four links of the socialist social production process. After studying the internal relations of these economic categories, [one must] duplicate them dialectically and logically both in abstraction and in substance. This is precisely the mission of socialist political economy.

FOOTNOTES

1. "Das Kapital," Vol 1, p 5, Translation by Guo Dali [6753 1129 0500] and Wang Yanan [3769 0068 0589], 1963 edition.
2. Ibid, Vol 3, p 971.
3. Xiong Yingwu [3574 2503 2745]: "The Object and Method of Economics," Heilongjiang Daxue, XUEXI YU TANSUO [Heilongjiang University, LEARNING AND EXPLORATION], No 2, 1979.
4. "What Are the 'People's Friends,' and How They Attacked the Socialists," "Complete Works of Lenin," Vol 1, p 9.
5. Zhang Wentian [1728 5113 1131]: "The Duality of Production Relations," JINGJI YANJIU No 10, 1979.
6. "Das Kapital," Vol 1, p 179. Translation by Guo Dali and Wang Yanan, 1963 edition.
7. (Luo) La-he-mu-te: "Opinions Concerning the Position of Political Economy in the System of Economic Sciences." SELECTED ECONOMIC TRANSLATIONS, No 4, 1979.
8. "Selected Works of Marx and Engels," Vol 2, p 92.
9. "Das Kapital," Vol 1, p 626, Translation by Guo Dali and Wang Yanan, 1963 edition.
10. "Anti-Duhring," "Selected Works of Marx and Engels," Vol 3, p 186.
11. Ibid, p 90.
12. "Selected Works of Marx and Engels," Vol 2, p 101.
13. This author agrees with Comrade Ma Shufang [7456 2885 5364] that the term possession relations refers to the means of production and labor. See Ma Shufang: "What Should Production Relations Cover?" JINGJI YANJIU No 12 1976.
14. "Das Kapital," Vol 2, p 44.
15. "Critique of the Goethe Program," "Selected Works of Marx and Engels," Vol 3, p 13.
16. Ibid, Vol 2, p 102.

17. Sun Yefang [1327 0396 2455]: "On Production Relations, the Object of Political Economy," JINGJI YANJIU, No 8, 1979.
18. "Selected Works of Marx and Engels," Vol 2, p 99.
19. See Lin Zili [2651 1311 0500]: "Problems Concerning the Study of Economic Theory," RED FLAG, No 12, 1979.
20. "Introduction," "Selected Works of Marx and Engels," Vol 2, p 99.
21. See "Das Kapital," Vol 1, Chapters 4 and 24.
22. "Selected Works of Marx and Engels," Vol 2 p 111.

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NATIONAL POLICY AND ISSUES

ECONOMIC JOURNAL DISCUSSES ENTERPRISE MANAGEMENT

HK220820 Beijing JINGJI YANJIU in Chinese No 9, 20 Sep 80 pp 9-15

[Article by Cai Jianhua [5591 1696 5478], of the Wuhan Iron and Steel Company Party School: "On Enterprise Management Has the Attributes of a Productive Force" (title of original article was "The Management of Industrial Enterprises")]

[Text] Does enterprise management possess the attributes of a productive force? This is a question which is increasingly being asked and debated by everyone involved in studying and strengthening enterprise management. That this question has been raised, has great significance both in theory and in practice and if we are to answer it, we must establish links between enterprise management and productive forces. Our ultimate goal is to make it clear whether or not enterprise management has the attributes of a productive force. If the resulting judgment is that it does possess these attributes, what part does it play in the system of productive forces? How do these attributes of a productive force, as well as its other attributes, coexist in the overall set-up of an enterprise? In order to explain these and other points, we must first of all satisfy ourselves as to whether or not the category of productive forces includes the element of management.

While pondering the above questions, let us consider a few obvious aspects.

1. The Forces of Production Include the Element of Management

The forces of production constitute an extremely important part of historical materialism and of political economics. In Marx' works, discussions pertaining to the forces of production often appear. However, as in his investigations of other problems, Marx did not start out with a definition, but rather arrived at an explanation of the most important content of the forces of production by means of deductions by using the principle of seeking truth from facts, made on the basis of specific analyses in various situations and all kinds of elements which directly influence or determine the forces of production of material wealth. For the time being, I will cite the following two statements as proof of this: "If we ignore the specific natural characteristics among men, as well as the differences in their production skills, then the productive forces of labor should be determined, most importantly, by: 1) The natural conditions

of labor, such as the fertility of the land, or the richness of a mine, and so on; and 2) The daily improvement of the productive forces. The following elements give rise to this improvement: Large-scale production; the concentration of capital; the alliance of labor; the allocation of work; machinery; the improvement of production methods; the application of chemical or other natural elements; savings in time and space gained through the profitable application of transportation and communications; and all kinds of other inventions. Science relies on these inventions to press the forces of nature into the service of labor and, moreover, the social character or the cooperative nature labor develops by utilizing these inventions. (The Complete Works of Marx and Engels, "Wages, Prices and Profits," vol 16, p 140) "The productive forces of labor are determined by many different sets of circumstances, including: The mean level of workers' of skills, the level of scientific development, and the level of its application in the various crafts; the social integration of the production process, and the scope and usefulness of the means of production, as well as the natural conditions." (Marx: "Capital," People's Publishing House, 1975 edition, p 53)

The above statement shows us that: 1) The productive forces are the composite forces used by men to control, apply and improve nature, and to produce material commodities and material wealth; 2) The elements which directly influence and determine the forces of production are many and varied; and 3) The present analysis includes the element of management. The phrase, "The daily improvement of the productive forces," contained in the earlier statement, contains the implication of management capabilities. The matter is quite clear: The productive forces do not here refer to the various elements like "large-scale production..." either individually or as a whole. Rather, in this case, the latter are merely the elements which "give rise to" the former, that is to the social forces of labor. In analyzing the general character of enterprise management, Marx raised the matter in exactly this way, maintaining that large-scale production, work allocation, cooperation and so on gave rise to and determined enterprise management. If this point is still in doubt, the phrase "the social integration of the production process," contained in the second passage, makes matters even clearer. According to our usual understanding of the term, "the social integration of the production process," that among the elements making up the forces of production it refers to organizational management. ("The social integration of the production process' is interconnected with the outcome of the application of organizational management knowledge possessed by the metal workers in management." (Li Lianke [2621 6647 4430], "An Examination of the Internal Motive Forces of the Forces of Production," "Philosophical Research," No 3, 1980.) This is because, within the system of the productive forces, only organizational management possesses this ability to apply integration. (This point will be discussed below.)

Any categorization or theory must be developed on the basis of practice, and must be made the subject of continual inquiry and research. The categorization of the productive forces is not an exception to this rule. When the productive forces reach their present stage of development, many new characteristic features tend to appear, and one of these is their increasing

concentration and systemization. As for the human element, in the earliest period of human society, there originally appeared a species of collective force, but later, with the appearance of metal tools and the increase in labor efficiency this was gradually dispersed into scattered natural economic production forces. Thus, with the development of science and technology and the appearance of socialized large-scale production, the human element in the forces of production tended to concentrate and merge. It appears that things underwent a development process which was a negation of another negation. Nevertheless, the unity existing at present has fundamental differences from the primitive unity. [HK220822] In a modernized enterprise, man's understanding of the entire production process, his grasp of production experience at all the various linking junctures, his mastery of the whole range of production technology, and his individual invincibility and completeness, all contribute to the formation of a fairly formidable organization. From this arises organizational management problems. If organizational management is ignored, man as an individual is incapable of constituting the human element within the current productive forces. To return to the overall aspect of the forces of production, the modernized productive forces are a system, composed of a great many elements. However, they are not a mechanical collection of elements, rather they constitute an organic system. This system possesses the characteristic of forming those novel qualities of its constituent elements which, individually speaking they do not have, and this is manifested as a systematic projection. By means of modernized technological and mathematical methods, throughout the production process, from the individual level right up to that of teams and groups, it forms an integrated control system. This way of setting up the productive forces, with its style of integrated projects, causes quantitative leaps to occur in the productive forces. Moreover, these productive forces are interwoven with modernized enterprise management. Thus, if management is left aside, there is then basically no way in which the modernized forces of production can be comprehended. If our research into the forces of production were to remain at its original level, with management still placed outside its field of vision, then it might well become completely divorced from reality, would not be able to arrive at a correct theory of the productive forces, and would not be able to give free rein to a theory for its application as a guideline for practice. We only need to focus our attention on the systematic conception of the productive forces, and we will immediately find that enterprise management is without a doubt an important element in the productive forces of all enterprises.

2. Management Work Is Productive Work

Enterprise management is an important element in the productive forces of an enterprise, and this is closely related to the quality of labor. Because enterprise management "is a type of productive work, it is work which must be carried out in every integrated production plan." (Marx: "Capital," vol 3, p 431) If a comparison is made between the industrial capitalists of the early period of capitalist society, who carried out the task of enterprise management, and those who simply lived off their investments, striking differences emerge. Those who acted as capital personified exploited the labor of other people which is an important aspect; at the same time, their labor was also derived from social labor in its integrated form, and this had nothing

whatever to do with capital. Following the development of capitalist production, joint-stock enterprises became more and more numerous and, as a result, enterprise management was gradually completely cut off from the capitalists, and management was undertaken by managers and experts. Although these managers, objectively speaking, also put into effect the activities and functions of capital, nevertheless they differed from the capitalists in fundamental respects. They were workers in capitalist enterprises, and their wages and salaries were quite different from the earnings of the owners of the enterprises; they were thus of a similar nature to the wages of the other workmen. In socialist enterprises, there are also different circumstances. Here, the means of production no longer stand in opposition to the power of capital and to human labor, and are no longer a means of gratuitously possessing the labor of working men; this is because the means of production are no longer the property of the capitalists, but are rather the property of the whole people or of the collectives, held in trust for the workers of enterprises. Hence, the management and workers of socialist enterprises are all the owners of the enterprises, and there is no differentiation between noble and base, between high and low, only differences in the allocation of labor. One section is formed of workers, who carry out operational duties; another is made up of management personnel, who carry out management duties, and who are in fact workers who are directly concerned with production carried out by their enterprises. The contrast which existed between management work and operational work has now disappeared, as has the antagonism between management personnel and workers. Management personnel and workers carry out their work with a unified production process, creating wealth for the state and for society. This is particularly true in the case of modernized enterprises, where workers in jobs with a high level of automation have transformed their role from the original one of simple operations to one of observation, monitoring, adjustment, control and preservation, all on a highly scientific and technological basis, while also carrying out some management duties. In these cases, the divisions between management personnel and workers, and between management work and operational work have permeated each other, and have been linked together to form the productive work of enterprises.

The productive nature of enterprise management work is also determined by the special features of management work. This is because enterprise management is not only a branch of science, but also a branch of production technology. As has been mentioned above, this is especially true in modernized enterprises, which make wide use of advanced scientific and technological measures and mathematical methods, resulting in management leaping to new levels. Enterprise management is not only scientific, systematic and popularized work experience and work methods, it is not only a branch of science possessing a complete theoretical system, but it also needs to utilize a complete scope of special methods in order to reorganize the objective world of enterprises. It must resolve a series of complex practical problems in order to achieve the finest production results; hence it is to be considered even more as a branch of technology. Involvement in this kind of scientific work naturally counts as productive work.

[HK220824] If the process of integrated social production gave rise to enterprise management, the strong points and defects in enterprise management work determine the ups and downs of the production efficiency of labor and, because of this, enterprise management constitutes an important element of the forces of production. It has repeatedly been proven in practice that advanced enterprise management, along with other advanced elements of the productive forces, can greatly reduce the length of the production cycle, can raise output, increase the variety of products, improve quality, reduce consumption of raw materials and increase profits. It is not simply one of the elements of the productive forces, but is in fact the decisive element which spurs on the other elements of the forces of production.

3. The Integrating Effects of Management Within the Productive Forces

After discussing the productive forces element of enterprise management from the above two angles, it is still necessary to gain an understanding of its concrete applications within the forces of production.

The social integration of the production process is Marx' outstanding summary of the application, position and state of enterprise management in the productive forces. Enterprise management comes into being only when the production process possesses an integrated pattern, and constitutes "work which must be carried out in every form of integrated production." An integrated production form constitutes the conditions under which management comes into being, and is also the outcome of the integrated application of management.

According to the Marxist view of the various conditions as well as with the normal practice of the people engaged in modern enterprise management, in their analyses and surveys of the productive forces of enterprises, we will fix the elements of the productive forces as equipment, manpower, raw and processed materials, science and technology and management. The integrated applications of management are specifically manifested as:

The Integration of Individual Sets of Equipment Into an Organic System

Individual sets and a system are opposites. Modernized technical equipment is endowed with a very strong "cumulative" and systematic nature. But, in comparison with a large system, a small system is also an individual unit, and we are left with the problem of its gradual integration. In this case, the application of enterprise management is to integrate individual units into a system, and the smaller systems into a larger one, and direct them to carry out their activities and their development according to set objectives. In short, according to the level of advancement, needs and capabilities, it carries out the selection and forming into complete sets of technological equipment; it carries out comprehensive overall planning of industrial sites, and organizes in a rational way the technological processes applied to various crafts, as well as the arrangement of equipment, and it also tightens the links between installations; it rationally applies and stipulates the operational use of equipment and methods of preservation of that equipment, standardizing the procedures; and it decides on the updating and replacement of equipment. Thus it recycles itself.

The Formation of Isolated Individuals Into a Dynamic Group

As has been mentioned above, manpower in enterprises is a complex concept. The manpower in an enterprise of large-scale socialized production cannot be understood from the point of view of small-scale production. This also means that the element of manpower which moves towards making up the productive forces of an enterprise signifies a collective rather than individuals. In the form, activities and development of this collective, the applications of management are as follows: According to the objectives and requirements of production, it determines the composition of personnel in terms of type, (or specialty), quality, (or ability), and numbers; it determines the overall allocation of space or personnel, (their posting), their duties and their rights; it determines the cooperative relations between all sectors; it determines work norms for personnel by arousing the enthusiasm of the personnel; it sums up, accumulates and spreads out work experience and technical abilities; it determines in a planned way both intensively and extensively, the development of personnel, and so on. Thus, as far as the element of manpower in the forces of production is concerned, the integrated application of management does not only determine its quantity, but also decides, qualitatively, whether or not it constitutes an element of the productive forces.

The Integration of Scattered Raw and Processed Materials Into a Whole Which Corresponds to the Set Objectives

The raw and processed materials involved in enterprise production are many and varied. Take modern steel-making as an example. The raw and processed materials required for this undertaking amount to 14 major types, 719 varieties, and 21,298 specifications. Some items of production require even more numerous and complex materials. How to adopt the scheme which is best suited to production needs, to the natural resources, the requirements of the equipment, to the geographical environment and to market conditions, how to introduce raw and processed material into the production process in a planned way, while fusing together equipment and the work force into one body, this is another big problem in deciding the relative superiority or inferiority of the productive forces of enterprises. Well-organized management not only directly increases the level of the productive forces of enterprises, but also avoids wasting any of society's natural resources.

The Transformation of Science Into Practical Production Technology

[HK220826] "Science is also included within the productive forces." (Marx: "Outline for a Critique of Political Economics, (draft version)," Book Two, People's Publishing House, 1963 edition, p 350) Nevertheless, science is definitely not directly the equivalent to the forces of production. Science is the system of knowledge by means of which people understand, and promulgate, the laws of nature. A fairly large proportion of scientific knowledge needs to pass through certain intermediate stages, transforming itself into production skills and techniques which bring a counterreaction to bear on the natural world, before it can in reality, constitute a productive force. In enterprises, the role of the transforming medium is that of enterprise management. Through the application of management, and the intensification of scientific research,

the results of scientific study are exchanged, in the shortest possible time, for production skills and technology and, moreover, technical evaluations and efficiency studies are made, which in turn further determine the research program, and initiate a new cycle.

At present, people are able to understand that science and technology constitute a force of ever-increasing importance in the development of the production forces and in the raising of work efficiency in production. The proportion of work efficiency in production brought about by the use of advanced science and technology, has risen from 20 percent at the beginning of the 20th century to 60-80 percent at the end of the 1970's. Without the slightest doubt, this proportion will be raised still further in the future. This is due to the fact that, "under even the most ordinary circumstances, science still develops on the basis of geometric progression." ("Complete Works of Marx and Engels," "Outline for a Critique of Political Economics," vol 1, p 621) This tendency towards accelerated development in science should further bring about a trend towards the accelerated development of production. However, we must not overlook another instance of cause and effect: Many of the scientific and technological achievements of developed countries are attained through the strengthening of organizational management. Deciding on the strategic direction for scientific development, and promoting the mutual transformation of science and technology, by means of management and increased scientific research, is still a key problem in the development of the productive forces of enterprises.

The integrated application of enterprise management within the productive forces of enterprises appears not only inside each separate element, but is manifested also between all the various elements, synthesizing all these elements into a composite force, into an overall capacity which will work in concert for the realization of the goals of the enterprises. This composite force will be called upon to carry out the following functions: To make overall policy decisions as to the effective level of the productive forces in enterprises; to reveal contradictions among all the various elements and links, and to coordinate the relations of development of these elements and links; to direct the practical activities of the production forces, and to examine the practical results of these activities; to lay down the path for the further development of the productive forces, as well as the overall policy concerning the speed and the stages of the development, and so on.

Only when the above integration has been brought about through management can the workers in enterprises achieve, in a rational and orderly way, their material alternation with the natural world, bring the forces of production under their control, and prevent those forces from dominating them, in the form of a blind power.

Only when the above integration has been achieved through management can all the various elements of the productive forces become real elements and real productive forces. If this integration is not achieved, they can only be latent or semilatin elements, and latent or semilatin productive forces.

Numerous facts from real life prove the truth of this principle. For example, in 1964 a certain organization spent RMB 50 million to import from abroad a complete plant for the production of 316 millimeter seamless steel tubing, with an output capacity of manufacturing 150,000 tons yearly. However, up till last year, this plant was still lying idle in a warehouse. (See the PEOPLE'S DAILY of May 1979) Steel-rolling machines are, needless to say, an element of the forces of production, but, through the fault of management, this rolling-plant was permitted to remain in storage for 16 years. According to foreign friends, the production capacity of some of our enterprises could, with all-round quality management be raised by 50 percent, even without increasing their equipment or enlarging their staff. This means that, considering only this one aspect of all-round quality management, the actual production capacity of some enterprises stands at only two-thirds of potential production capacity, and thus that one-third, or even more, of their production capacity is lying idle. So, if the integrating force of enterprise management is ignored, enterprises will have no production capacity.

To sum up what has been said above, the integrating effect of enterprise management within the set-up of the forces of production has two general aspects: one is the molding of all the various elements of the productive forces into an organic "multilateral pooling of efforts," which will lay before us the finest levels and the best state of affairs; the other is the continual stirring up and exposure of contradictions in the internal links of the productive forces, the adjustment of the relations of development of those links, and the making of policy decisions on, and the control of, the direction, scope and speed of development. Only when this type of enterprise management exists can enterprises utilize their productive forces and conduct all their other activities.

4. The Unity of Opposites in Some Attributes of Management

As everybody knows, enterprise management is a pioneering science formed through the systematic integration of social science, natural science and engineering, and possesses special characteristics of many different functions, at many administrative levels, and of many qualities; it not only contains the attributes of a productive force, but also attributes of production relations and of the superstructure. Now how do these diverse qualities exist, and how do they achieve unity, within a management entity? To answer this question, we are obliged to make a study of the conditions under which these diverse attributes exist, only when this point has been researched can we arrive at an overall understanding of enterprise management and the productive forces of enterprises.

These diverse attributes achieve their existence and their expression through certain specific kinds of enterprise management work, and can be summarized as three different sets of circumstances:

If three kinds of attributes are manifested as three distinct and differing types of management work.

Within enterprise management, there are some types of work, mainly arising from the activities of the productive forces, which are manifested only as the relations of material alternation of man with nature which can be seen in the activities and the development process of the productive forces of enterprises, and which at different times possess the qualities of other aspects. These types of work include, for example, directly bringing all kinds of management measures of a technological nature to bear on the direct production process, the analysis and control of production capacities, the rational overall distribution of equipment, the formulation of policy decisions, plans, and organized directives of a technical nature within the process of transformation of achievements in scientific research into production technology, and so on and so forth. This specific type of work and assignments belongs only to the rational organization of the forces of production. Some kinds of work and assignments belong only to the rational organization of the forces of production. Some kinds of work arise mainly from the relations of production, and manifest themselves purely as the relations between man and man, as the relationships of people towards the ownership, possession and use of the means of production, as the relations of economic advantage, but does not simultaneously possess the qualities of other aspects. These other aspects would be, for instance, such things as autonomous enterprise management, all kinds of economic methods and measures used in the process of production management, and the analysis of all sorts of economic activities. This specific type of work and assignments belongs only to a state of perfect production relations. Some kinds of work arise mainly from the demands of political economics, which are manifested only in their promotion of and their protective effect on the productive forces and the movements of the relations of production, and which do not simultaneously possess the qualities of other aspects. These would be, for example, such things as all kinds of political activities, all kinds of economic legislation, and the upholding of social order. This kind of work belongs to the adjustment and scope of the superstructure. Of course, when we say that these things are manifested only as certain relationships, and do not simultaneously possess the qualities of other fields, this is a relative and not an absolute statement, which can only be understood on the basis of the fixed nature of the quality. In cases where some kinds of work may still exhibit with slight traces of the relations of other aspects, the character of these kinds of work should be determined according to the dominant aspect.

Three Kinds of Attributes Are Jointly Manifested as a Type of Management Work

Some types of management work arise from, and are determined by, the combination of a multiplicity of elements and so their attributes are also multifarious; namely, they possess the attributes of a productive force as well as those of production relations and of the superstructure. Like the organization of labor, it arises from and is determined by a multiplicity of elements. These elements are: the level of development of science and technology; the degree of socialization of production; the type of products manufactured; the number and qualifications of the workers; the working environment; the methods and level of organized direction; the nature of the system of ownership of the means of production; the assignments and demands of the state in the field of political economics, and so on. These elements all have an influence on and

define, from different angles, the form and content of the organization of labor. In this way, the same labor organization simultaneously possesses a multifarious nature. One of its aspects is manifested as man's connections with the technical aspects of natural materials, and appears within the direct production process, among the workers, in their capacity as an element of the productive forces, between the workers and their technical equipment and the subject of work, and in the specific distributional relationships of time and space, and in the composite form of these relationships. This composite form is the outcome of the comprehensive application of all the various elements of the productive forces. From this point of view, it possesses the attributes of a productive force. However, in another aspect, it is manifested as the relations between man and man, and appears in the positioning of people and their mutual relationships, under a given system of ownership of the means of production. This set of circumstances is also the outcome of the comprehensive application of the relevant elements of the relations of production. From this point of view, it also possesses the attributes of a relation of production. Apart from this, the organization of labor is often manifested in man's political relationships, appearing as its unity with specific political organizations (such as its unity with organizations like the party, the Communist Youth League, the trade unions and the armed forces); these political relationships are the outcome of the comprehensive application of the relevant political elements. [HK220830] From this point of view, it also simultaneously possesses attributes of the superstructure. Thus the three kinds of attributes, of the productive forces, of production relations and of the superstructure, are dialectically united in one labor organization.

Two Kinds of Attributes Are Manifested as One Type of Management Style

Some work arises from, and is determined by, the movements of the productive forces and the relations of production, possessing at the same time, the respective attributes of the productive forces and the relations of production. For example, the activity of increasing production and practicing economy in the direct production process; one aspect of this is to economize on work time, reducing production costs as low as possible so that the relations of labor at the time of commodities exchange show a quantitative change, so that this activity contains attributes of the relations of production. "But this kind of economizing is equivalent to developing the forces of production." "Economizing on work time equals developing the productive forces." (Marx: "Outline for a Critique of Political Economics, (draft version)," Book Three p 364) Some types of work arise from and are determined by the movements of the relations of production and of the superstructure, possessing at the same time the respective attributes of production and the superstructure. An example of this work is that which deals with property. Because enterprises, and especially large-scale coordinated enterprises, constitute a pluralistic social organization, they form a small-scale society within themselves. Thus, the material activities of enterprises are not simply a matter of economic receipts and distribution, but include economic activities of a political nature.

The contradictions and the unity of the three kinds of attributes contained within the work of enterprise management coalesce to form a complete entity of enterprise management.

5. Two Revelations

First, that aspect of enterprise management which has the character of a productive force but does not possess a class nature and can be passed on and absorbed in a direct manner.

Marxism holds that, "Any productive force is a currently existing force, and is the product of past activities." ("Selected Works of Marx and Engels," "Letter to P.V. Annenkou" (28 December 1846) vol 4, p 321) It is reflected in natural relationships. That aspect of enterprise management which possesses the attributes of a productive force also constitutes a currently existing force in human society, and is the measure and the manifestation of mankind's conquest and control of nature; it is an objective entity of a production organization; it appears before us as the already perfected physical and mental conditions of production. It is the culmination, in historical terms, of the combined technical skills and experiences of previous generations of workers, and it is the starting point for the combined technical skills of the next generation of workers. During the upward progression of history, beginning with the writings of Bai-bie-ji [2157 0446 0679] which were the first works on management of industrial enterprises in the 1830's, through the scientific management proposed by Tai-luo [3141 5012]. At the beginning of the 20th century and modern management of the 1930's, right up to the management of the World War II period, and especially that of the post-war period, enterprise management has developed into a completely modern branch of science. It possesses its own distinctive ideological and theoretical system, substance and methods. Most of the relevant writings in this field have come from the pens of bourgeois scholars, and thus carry the clear imprint of the capitalist relations of production and superstructure. Nevertheless, as far as the substance of its having the attributes of a productive force is concerned, it represents the summarization of mankind's common work experience, and constitutes "a series of the most fruitful achievements in science." ("Selected Works of Lenin," "Present Tasks of the Soviet Regime," vol 3, p 511) Hence, our attitude towards capitalist enterprise-management should be: the entire substance of all capitalist private ownership systems, of all systems for the exploitation or oppression of the workers, and of all work patterns and life styles tainted with a rotten ideology, as well as all the production relations and relevant aspects of the attributes of the superstructure (apart from certain forms and scientific methods), must be criticized and resisted; however, the content of those aspects which possess the attributes of productive forces should, within this fixed scope, be adapted in China, and freely taken in and absorbed, as in the case of absorbing advanced science and technology, allowing it to fuse together with the socialist system of public ownership, and bring into being a new system of socialist enterprise management.

Second, in developing the productive forces of Chinese enterprises, prominence should be given at present to the exploitation of enterprise management.

Within the system of the productive forces of an enterprise, all the various elements advance forward, conditioning each other, complementing each other, and transforming each other. But contradictions are generally unevenly distributed, in different stages and under different conditions, and the various

elements of the productive forces frequently alternate in playing a moderating role. It follows that, in researching the internal relations of development of the productive forces of enterprises, specific analyses should be made according to circumstances. Within a particular period it is possible to emphasize the development of this or that element, or to develop several elements at the same time. Now what is the key link in our present improvement of the productive forces of Chinese enterprises? It consists of the elements of science and technology and of management. But, seen from the relationship of the two elements, the rapid development of science and technology will only be possible under improved management.

[HK220832] Experience has shown us that the installation of advanced technical equipment where the management is backward is not to be contemplated; nor does the simple possession of modernized equipment insure the creation of modernized enterprises. If the management link is weak, even if technical equipment has reached a high level of advancement, then the system of productive forces will remain backwards. In the last few years, China has imported from other countries several complete advanced technological installations, and set up some new type enterprises. In a partial sense, they have really achieved modernization. However, from the overall aspect of the productive forces of enterprises, this assessment is incorrect because their production levels are still much lower than in comparable foreign enterprises, and they utilize from two to three times as many workers and staff members as their foreign counterparts. The factors contributing to this situation are, of course, many and varied, but investigations have proved that the overriding reason lies in the fact that the level of organizational management is too low, and that technical equipment, labor and raw materials and so on, have not been integrated into an organic system. China's present level of enterprise management still lags 15 or 20 years behind her present technical equipment, and compared with the international level of advancement, the discrepancy is even larger. Thus, in some enterprises, if unrevealed contradictions within the system of productive forces cannot be predicted, then it will be impossible for some time to resolve those contradictions which have already been exposed. So, from this it may be seen that the task of exploiting enterprise management in the development of the productive forces of enterprises is becoming more and more important.

Because enterprise management still contains attributes of the relations of production, so in the exploitation of enterprise management, it has the effect of opening up many kinds of economic resources, and is a key factor in promoting the movement of the basic contradictions in enterprises.

The exploitation of the resources of enterprise management also has the advantage of reducing investment and producing quick results. Because the function carried out by enterprise management is that of the integration of the overall movements of the productive forces, it can organize, in a rational way, the material forces which are at present in existence.

When Lin Biao and the "gang of four" were on the rampage, nobody dared to undertake research into enterprise management, with the result that, for many years,

this important problem was only infrequently studied. At present in China, it is absolutely essential that our theoreticians once again probe into this area in order to develop a socialist theory of enterprise management, to build on the fundamental tenets of Marxism, and to give impetus to the realization of the four modernizations.

(This journal received the manuscript of this article in May 1980.)

CSO: 4006

NATIONAL POLICY AND ISSUES

ROLE OF PRODUCTIVE FORCES DECISIVE TO MODERNIZATION

Xi'an XIBEI DAXUE XUEBAO: SHEHUI KEXUE BAN [NORTHWEST UNIVERSITY JOURNAL (SOCIAL SCIENCE EDITION)] in Chinese No 1, Feb 80 pp 19-25

[Article by Liu Chengsi (0491 2110 1835): "Recognize the Final Decisive Role of Productive Forces"]

[Text] "People are bound to develop, in the society where they live, definite and inevitable relations in production which are not subject to their own will."¹ In a letter to P. V. Annenkov dated 28 December 1846, Marx explained this point even more clearly. He said:

"Are people free to choose a particular form of society? Absolutely not. When the people's productive forces develop to a given extent, there are bound to be definite forms of exchange and consumption. A particular social system will emerge during the development of production, exchange, and consumption." The reason people are not free to choose a particular form of society is that, in the final analysis, people are not free to choose their own productive forces. That is the foundation of their history, because any productive force is a force already acquired--the product of past activities."² We must notice here "the product of past activities." This is why people may not abandon the level of development of productive forces already existing in history and establish particular production relations and a particular form of society as they wish.

Capitalist production relations were formed within feudal society on a foundation where the natural economy had been dissolved by a commodity economy. The capitalists and their hired workers, both parties to this particular kind of production relations, were not responsible for the formation of this kind of production relations, which were not the result of the free choice of either the capitalists or the hired workers. "My personal view is that the development of social economic formations is a natural historical process. No matter how subjectively aloof an individual stands above these relations, he is socially the product of such relations." So, Marx said: "I am of the opinion more than anyone that no individual should be held responsible for these relations."³

Marx's opinions are quoted here to underscore the fact that in the history of human society, productive forces always play the final decisive role. This does not imply that production relations, like the superstructure, are passive matters determined completely by productive forces and the economic foundation. Production relations and productive forces, like the superstructure and its economic foundation, always react in two different directions (either enhancement or obstruction).

Years of political education and theoretical propaganda have turned this basic Marxist principle into a matter of commonsense in our country. If that were the case, why do we still harp on the "same string?"

The People's Republic of China is already 30 years old. Apart from the 10 years of disaster brought about by Lin Biao and the "gang of four," we made mistakes and sustained setbacks in the years prior thereto. No doubt, compared with preliberation days, our achievements are undeniably impressive. However, the superiority of the socialist system (the superiority of the socialist system over the capitalist system in the history of human society) has not yet been brought into full play. This view is shared by a large number of people. Spurred by the spirit of the Third Plenum of the 11th Party Central Committee, many comrades have emancipated their minds and begun to look for the cause. I have done some thinking during the past year of study. Acting on the strength of "upholding truth and amending errors," I have put down my views in writing, and invite discussion and criticism.

I.

The first question we face is: What is socialism, anyway? Now the theoretical circles run into the same question in their discussion of the stages of social development after the proletariat came to power. Everybody agrees that public ownership of the means of production is the most basic characteristic of a socialist society.

However, public ownership of the means of production is not something that many may order at will. It is an objective requirement when the production process has become socialized to a given degree (including socialization of labor and the means of production). "Since the emergence of the capitalist system of production, complete possession of the means of production society has been an ideal cherished by both individuals and groups. It may become possible and historically inevitable when the material conditions of its realization are present."⁴ The "material conditions" referred to by Engels are the modern productive forces which are conclusive to socialization of the production process. There is no objective need to organize a socialist society to practice public ownership of the means of production unless there are such socialized productive forces.

If this is so, then we have to answer another question. Neither the capitalism in China of 1949 nor that in Russia of 1917 was highly developed, and there were no such material conditions as highly socialized production. Could we say then that both China of 1949 and Russia of 1917 should not have had any kind of socialist revolution?

As a matter of fact, this question was answered long ago by Lenin in his criticism of the "heroes" of the Second Internationale, who claimed that "Russia's productive forces have not reached the level to realize socialism."⁵ While admitting that Russian productive forces at the time were backward, and that it takes a higher level of productive forces to realize socialism, Lenin said that inasmuch as the proletariat is reinforced by the forces of the peasants, and the conditions and opportunities are ripe for wresting political power from the landlord capitalists, "why couldn't we secure the prerequisites for reaching such a level through revolution, and then launch a drive from the base founded on worker-peasant power and

the soviet system to catch up with the people of other countries?"⁶ "You people say we need culture to build socialism. Excellent! But why couldn't we create in our country the prerequisites for attaining that kind of culture by overthrowing the landlords and the Russian capitalists first, and then advance toward socialism? Which book tells you that the general course of history would not and could not make room for these changes?"⁷

As attested by reality, Lenin was right. But the crucial issue is that, after seizing political power in a country as economically backward as ours, the proletariat must create the material foundation required to bring about a transition to socialism.

After the October Revolution, Lenin was obviously concerned about this problem. He reiterated that socialism could not be achieved without big industry. "The only material foundation of socialism is a big-machinery industry which can also transform agriculture."⁸

We know that after the October Revolution, due to unfavorable conditions both at home and abroad, Russia resorted to "military communism." Later, when Lenin discussed the "New Economic Policy," he reiterated once again: "It is a wrong idea to plunge into outright transition to communist production and distribution,"⁹ because it is impossible for a country dominated by a petty agrarian economy to go directly to socialism. In his writings and reports on the "New Economic Policy" after 1921, Lenin emphatically pointed out the need to utilize capitalism. He said: "Compared to socialism, capitalism is a menace. But capitalism is a blessing compared to the medieval system, the small-scale production, and the undisciplined petty producers associated with bureaucratism. Inasmuch as we are not yet ready to change from small-scale production to socialism, we just could not avoid capitalism, the natural outcome of small-scale production and exchange. Thus, we have to use capitalism (especially trying to lead it to state capitalism) within a given area as an intermediate link between small-scale production and socialism and as a measure, a vehicle, a method, and a road to raise the productive forces."¹⁰

If it were necessary to do this under conditions existing in Russia, it would be even more necessary to do it in China, a country more economically backward than Russia. (In 1949, the modern industrial output value of our country was only about 10 percent of the gross national output value, over 80 percent of which was dominated by individual and handicraft economy. According to statistical records, our country in 1949 had a total of 59,776,000 heads of cattle, horses, and donkeys. If all these had been used for farming, we would not have had enough to provide each of the 110 million farm households with a single farm animal.) In fact, our party pointed this out clearly on the eve of liberation: "...since the economy of China is still backward, there is need for a considerable length of time after the triumph of the revolution to use the activism of urban and rural private capitalists as much as possible to promote the development of the national economy. During this period, any sector of urban and rural capitalism which is beneficial to and does not harm the national economy should be allowed to exist and develop. This is not only unavoidable but also economically necessary."¹¹ Comrade Mao Zedong explained even more clearly as early as 1945: "There are people who do not understand why communists are not afraid of capitalism and want to promote its development. Our answer is very simple. To substitute

certain capitalist developments for foreign imperialist oppression and Chinese feudalism is not only progress but also an unavoidable process. This is beneficial to the capitalist class and even more beneficial to the proletariat."¹²

Mao Zedong Though is in complete agreement with the thinking of Lenin, and that is exactly what we did after the founding of the People's Republic. In 1953 the party proposed "The General Line and Tasks for the Period of Transition," and laid down in no uncertain terms that it would take three five-year plans spread over a period of 15 years to achieve basic socialist industrialization and socialist transformation of agriculture, handicraft industry, and capitalist commerce. The transformation was actually completed in the first four years of the First Five-Year Plan Period--in reality within a period of 1.5 years, 1955 and the first half of 1956. Looking back, it seems that such speedy progress and such a pace of development do not quite agree with the objective law that production relations should keep pace with productive forces. A simple fact will probably help explain this point. That is to say, by 1956 (the time socialist transformation was practically complete) our socialist industrialization had just begun, and a number of big industrial projects over and above the quota of 156 had to wait until the inception of the Second Five-Year Plan. Moreover, our agricultural mechanization just could not be realized for quite some time to come.

The situation resulting from completing the socialist transformation 10 years ahead of schedule, in violation of objective law, is borne out by the resolutions adopted by the Eighth Party Congress on the political report. It was pointed out in the "resolutions" that the principal contradiction in our society at that time was "the contradiction between an advanced socialist system and a backward productive force." When the theoretical circles studied the "resolutions" of the Eighth Party Congress, they also advanced the view that "production relations are too far ahead of the productive forces." If efforts were made to ascertain objective facts, as directed by the "resolutions" of the Eighth Party Congress, and the priority of our party work were to be redirected in 1956 to socialist modernization, it would be entirely possible not only to correct the violations of objective law in the preceding period but also to arrest certain harmful developments still in progress then.

It is regrettable that since the expansion of the antirightist drive in 1957, the priority of the party has switched more to class struggle within the superstructure and to the realm of ideology, rather than to socialist modernization. At the same time, communes were organized in all villages in the country between 1958 and 1959, with emphasis on raising production relations in agriculture. The socialist transformation of agriculture, based on the objective law which the party had inaugurated, was now pushed aside. Thus, farm households leaped to become "big and collectivized" communes "in a single bound." While we accuse Lin Biao and the "gang of four" of "craving transition" in the 1970's, we must realize that the drive to organize people's communes in the late 1950's was also a kind of "craving for transition." Fortunately, the error was promptly corrected by the Party Central Committee, which defined ownership by the commune as a three-tiered ownership resting mainly on production brigades, so as to make agricultural production relations keep pace with productive forces.

As for Lin Biao and the "gang of four," the fact they raised the productions [targets] at will, without regard for the level of productive forces, and overlooked

the decisive role of productive forces was more than a "leftist" error contrary to objective possibilities; it was counterrevolutionary. But the "leftist" tendency in our economic work during the preceding period left them with loopholes which they exploited to such an extent that they even branded the development of production as "an obsession with productive forces; they labeled distribution according to work and the production of commodities as the hotbed of capitalism; and they crushed peasants' private plots, household sideline production, and country fairs, treating them as the "tails of capitalism." Their abuse of socialism and defamation of scientific socialism left the masses, especially youths, in utter ideological confusion. It is therefore the "sacred mission" of the theoretical circles to rehabilitate the reputation of Marxism and the socialist system.

II.

In short, the superiority of our socialist system has not come into full play in the past 30 years. Leaving aside the disruptions of Lin Biao and the "gang of four," a principal cause of this is that at times we have not realized in our work the decisive role of the productive forces, and we have violated the objective law that production relations should be compatible with productive forces.

In the past, we often focused our attention on possible stoppage and disruption of socialist productive forces when production relations trailed behind productive forces, but we failed to see that artificial promotion of production relations without regard to the existing level of social productive forces might obstruct and disrupt the development of productive forces. There are, however, objective factors which are responsible for this. Since a socialist economy is not likely to emerge within the old society, the proletariat must use political power to install it. This is why the personnel in power could easily overlook the objective law and make mistakes attributable to subjective personal will. Stalin found it necessary to devote the first part of his writing: "The Question of Socialist Economy in the Soviet Union" to this particular problem.

Furthermore, we must admit we have not done well in understanding the basic principles of Marxism. For instance, the following quotation from Marx's works is indeed worth careful study and deliberation:

"No social formation will perish before its capacity productive forces are brought into full play. Any new or higher production relations will not emerge until the material base on which they exist matures in the old society. Consequently, man may embark only on those tasks which he is able to handle, because he will discover upon careful examination that such tasks will not arise unless the material conditions required to tackle them are in existence, or at least are being formed."³ Here Marx explained very clearly the decisive role of productive forces in the development of human society. Keeping Marx's view in mind, let us assume that if we had proceeded according to the plan originally laid down by the Party Central Committee to achieve "industrialization and socialist transformation" in 15 years, beginning in 1953, and had acted as cautiously as Comrade Mao Zedong had described: "Take one small step every year and a big step every five years," the following would have happened:

First, by the end of the First Five-Year Plan (1957), about half of the peasant households would have formed production cooperatives, and all capitalist commerce would have been led, according to the conditions of each, to the orbit of state capitalism (purchase by the state, order placed by the state for manufactured goods, state monopoly of purchase and marketing, marketing on commission or by agent joint state-private operation), with emphasis on intermediate supply of manufactured goods and state monopoly of purchase and marketing.

Second, the Second Five-Year Plan (1958-1962), all villages would have completed cooperativization based on earlier production cooperatives. The transformation of capitalist commerce would have switched from the intermediate supply of manufactured goods and state monopoly of purchase and marketing to joint state-private ownership.

Third, after the Third Five-Year Plan, high-level agricultural production cooperatives would have developed in the villages until they had played a role leading to the basic completion of the cooperativization of agriculture. At the same time, the socialist transformation of capitalist commerce would have been basically achieved, moving step by step from state-private ownership to state-operated enterprises.

Our assumptions are not at all groundless. According to the projection of the Party Central Committee, socialist industrialization was scheduled only to lay the initial foundation by the end of the First Five-Year Plan. Similarly, the socialist transformation of agriculture, handicraft industry, and capitalist commerce was also expected only to lay a foundation. Take capitalist commerce, for instance. At that time it accounted for 39 percent of the gross national industrial output value, mainly the manufacture of consumer goods, but it accounted for 57.8 percent of the retail business of the whole country (based on statistical figures for 1952). At a time when the state was engaged in such capital construction as big industrial projects designed to advance heavy industry, capitalist commerce played an active role in producing more consumer goods to satisfy the people's need for daily necessities, bringing prosperity to the market through increased interchange of commodities between urban and rural areas, accumulating funds for the state's industrialization programs (beginning in 1953, the profit of privately owned enterprises was distributed "four ways," with 34.5 percent of the total profit surrendered to the state as income tax), and providing employment. This active role would be jeopardized if the transformation were too swift. According to the "First Five-Year Plan of the People's Republic of China for development the national economy," less than 50 percent of privately owned industry, based on output value, was to be converted to state-private ownership in five years.

Let us take a look at agricultural cooperativization. According to a "resolution concerning the development of agricultural cooperatives" voted by the Chinese Communist Party Central Committee on 16 December 1953, "during the First Five-Year Plan, by 1957, there should have been about 800,000 agricultural cooperatives, participated in, hopefully, by about 20 percent of all farm households. Even the "First Five-Year Plan of the People's Republic of China for developing national economy" did not ask for any more than one-third of the farm households to join the early form of production cooperatives by 1957. This matched very well

with the pilot program "to introduce limited local experiment of agricultural mechanization in five years."

Looking back, the decisions and resolutions of the Party Central Committee at that time were basically correct. This is especially true with the schedules and measures of agricultural cooperativization and socialist transformation of capitalist commerce, including measures such as "taking a small step every year and a big step every five years," taking three big and 15 small steps to achieve the "three transformations," and making the "three transformations" and "one industrialization" work closely. By the time we had finished constructing a complete industrial system (1967), capitalist commerce would have become socialist state-operated enterprises, and individual peasant ownership would have switched, or basically switched, to socialist collective ownership. If we had proceeded at such a pace, I am sure the "one industrialization" and "three transformations" would have been well adjusted, the gap between agricultural cooperativization and mechanization would not have been so great, and the enthusiasm of the peasants would have been activated by increased agricultural production and improvement of their livelihood. Had we taken 15 years as scheduled to transform capitalist commerce, its enthusiasm would have been brought into full play. Moreover, those measures worked out by the state for transforming capitalist commerce, such as "economic reorganization" and "personnel placement," would have kept our national economy in order and encouraged us to acquire useful business and management experience from the national capitalists, who would have helped train management specialists for the state (judged in the light of historical continuity, this ought to be one of the material benefits that capitalists could provide for socialism).

If these assumptions were valid, our national economy would have been as follows by the completion of the Third Five Year Plan in 1967:

1. The social productive forces would have developed so much that we would have been able to complete an industrial system based on modern technology and achieve substantial if not complete agricultural mechanization. It is very possible that we would have turned an agricultural country into an industrial one.
2. Public ownership (two different forms: ownership by the whole people and collective ownership) would have won a controlling position in the entire national economy. At the same time, some form of private ownership by individual workers (such as street hawkers, small handicraftsmen, husband-wife storekeepers) would have been preserved as the supplements or subsidiaries of the socialist economy in order to satisfy the need of the masses for daily necessities.
3. As production increased in volume, the wage of the staff and workers as well as the income of the peasants would have increased considerably. As a result, the people's livelihood, both material and cultural, would also have improved. (According to Premier Zhou's report on recommendations for the Second Five-Year Plan, the wages of staff and workers and the income of the peasants in 1962 should have been from 25 to 30 percent higher than those in 1957. The projected wages of staff and workers and peasant income for 1967 would be from 60 to 100 percent higher than those in 1957. This is entirely possible.)

4. As constructions continued to develop, if planned parenthood had been earnestly practiced since 1957, we might not have had to face the employment pressure which has become increasingly serious since the 1970's.

Why do we say that the task of achieving "one industrialization and three transformations" during the three five-year plan periods, as charted by our party in 1953, agrees with the objective law that production relations ought to match the nature of productive forces? What has been stated above may be summed up in two points: First, since our economy used to be very backward, slow, steady and varied measures of change are more suitable or closer to objective reality. Second, the national economy and the people's livelihood actually scored steady improvement during the progress of the First Five-Year Plan, 1953-1956. Today many old staff and workers still enjoy the real wage increases they got in those years, and the market was so prosperous then that people still miss the "golden age" of the "First Five-Year Plan."

III.

In spite of our subjective wishes, no matter how beautiful, the law of economic development is objective and inviolable. Take the year 1958, for instance. At that time those who wanted to crash into communism stirred up a "tempest of communism." They wanted to substitute a ration system in the villages for distribution according to work. They asked to uproot the bourgeois concept of lawful rights and to do away with commodity production. They even attempted to turn legends into reality and screamed about "subduing mountains and taming rivers," "making the earth produce as much as man wants," and harvesting 100,000 jin of grain from every mu of land. The outcome, of course, was hardship and suffering. The objective law finally forced the people to climb down from the heights they had reached.

The recklessness of Lin Biao and the "gang of four" in the late 1960's and early 1970's which drove our national economy to the brink of collapse is an entirely different problem, and is more than a simple matter of subjective violation of objective law.

Since the smashing of Lin Biao and the "gang of four," the Party Central Committee has restored the original face of Marxism and Mao Zedong Thought, arrested the deterioration of the national economy, and brought life back to normal swiftly and steadily. It upholds and revives what has proven correct in practice. It rejects and corrects what has proven wrong in practice. In a word, it has done a great deal to bring order out of chaos.

The Third Plenum of the 11th Party Central Committee decided to switch the priority of party work in 1979 to socialist construction geared to the four modernizations. This was followed by the eight-character policy of "readjusting, restructuring, consolidating, and improving" the national economy. The readjustment is scheduled to last three years, during which various measures will be adopted to reform systematically the existing system of economic management. These decisions of our Party Central Committee are called for in order to meet the existing conditions in our country. Theoretically speaking, these decisions are correct.

Realization of the four modernizations rests on extensive development of our social productive forces to provide the socialist system with a material technological base, without which the socialist system will not take root. Readjustment of the national economy is a necessary step leading toward the four modernizations. Reform of the system of economic management really aims at making the superstructure responsive to the need to make production relations keep pace with the development of the productive forces—a prerequisite to intensified drives to achieve the four modernizations.

Due to the low level of social productive forces and economic strength, our country still faces tremendous difficulties and many knotty problems. Limited in financial and material resources, our Party Central Committee and state leadership often find themselves inadequate to meet the challenges and unable to solve within a short time all the pressing problems. The only way out of this dilemma is to raise the level of our productive forces as soon as possible so as to accelerate production. Consequently, achievement of the "four modernizations" is our most basic and urgent task, and the biggest political issue for the whole country.

Socialist China is already 30 years old. "At 30, one must stand on his own feet." Tempered by both positive and negative experiences, our country will be able to stand on its own feet among the nations of the world. But we must learn from our past failures. In his National Day address in 1979, Comrade Ye Jianying summed up four lessons to learn and called the following the very first lesson. He said: "After the proletariat has come to power, and especially after the establishment of the socialist system, the priority of our work must be unflinchingly placed on economic construction, vigorously developing social productive forces, and gradually improving the people's livelihood. We must never abandon this order of priority, no matter what the obstructions are, unless we face massive foreign invasion."¹⁴

This lesson could not be summed up more appropriately. If we examine closely our experience of the past 30 years, we will see that the main cause of our failure to give full play to the socialist system's superiority and of the poverty which besets our country and our people is that in the past 30 years we actually abandoned this order of priority whenever we ran into obstructions. Isn't this true? Just imagine. If we had stood firm for this "work priority," would anyone question our ability to catch up with or get close to the generally developed countries (such as Britain and France), if not the most advanced ones? Had we done that, the face of our country would have changed completely.

Now we are on the right track. The lines, programs, and policies worked out by the Party Central Committee are correct. In his "address" on behalf of the Party Central Committee, Comrade Ye Jianying accurately summed up the lessons to be drawn from the experience of the past 30 years. The future looks really bright and encouraging, but there are still many problems, enormous difficulties, and objective obstacles ahead. Leading comrades of the party and government at all levels must resolutely carry out the programs and policies of the Party Central Committee. Judging from experience, this is not easy. If they are not committed to winning the people and lack communist stamina, they will block instead of implement the party's policy. The masses now are indignant with those who block

the implementation of the party's policy.) As for the cadres and the masses in general, they should understand and make allowances for the difficulties besetting the country, help the party overcome such difficulties, and work hard to contribute to the realization of the four modernizations. Groaning and grumbling in the face of difficulties are simply futile.

We are at a critical turning point in history. Achieving the four modernizations means providing our socialist system with a firm material technological base--a weighty matter concerning the future of our country and our people. It is unrealistic to talk about making the country wealthy and strong and about improving the livelihood of the people unless we realize the four modernizations. Have no doubt about the final decisive role of the productive forces--a scientific truth of Marxism which we have to remember.

FOOTNOTES

1. "Selected Works of Marx and Engels," Vol 2, p 82.
2. Ibid, Vol 4, pp 320-321.
3. Marx, "Das Kapital," Introduction to Vol 1, 1st edition.
4. Engels, "Anti-Duhring," People's Press, 1970 edition, p 278.
5. "Complete Works of Lenin," Chinese Edition, Vol 33, p 433.
6. Ibid, pp 433-434.
7. Ibid, p 435.
8. Ibid, Vol 32, p 446.
9. Ibid, Vol 33, p 43.
10. Ibid, Vol 32, p 432.
11. "Selected Works of Mao Zedong," Vol 4, p 1369.
12. Ibid, Vol 3, p 1009.
13. "Selected Works of Marx and Engels," Vol 1, p 83.
14. Ye Jianying: "An Address at the Mass Meeting Commemorating the 30th Anniversary of the People's Republic of China," People's Press, 1979 edition, p 22.

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CSO: 4006

NATIONAL POLICY AND ISSUES

'SOCIALIST CONSUMPTION ECONOMICS' CALLED FIELD FOR STUDY

Xi'an XIBEI DAXUE XUEBAO: SHEHUI KEXUE BAN [NORTHWEST UNIVERSITY JOURNAL (SOCIAL SCIENCE EDITION)] in Chinese No 1, Feb 80 pp 58-63

[Article by He Liancheng [0149 3350 2052]: "On Socialist Consumption Economics"]

[Text] Consumption in a socialist society is an important problem of political economies in socialism. A correct understanding of and solution to the problem bears special importance for arousing the socialist enthusiasm of the masses, bringing into full play the superiority of socialism, speeding up socialist productive forces. Thus it is extremely necessary to intensify the study of socialist consumption and to establish socialist consumption economics. This article deals exclusively with my personal views on the meaning, objectives and methods of studying socialist consumption economics, in the hope of inviting further discussion in our economics circles.

The Meaning of the Study of Socialist Consumption Economics

Marxist political economy tells us that production, distribution, exchange, and consumption are the four links of socialist reproduction, the totality of reproduction, of which production is the foundation and the decisive link. "Specific production determines specific consumption, distribution, and exchange as well as the mutual relations of these factors." (Marx: "Introduction" to "Critique of Political Economy," a monograph, p 22). At the same time, consumption, distribution, and exchange also act on production, which "is determined, in form at least, by these factors" (ibid). This is the dialectical relationship of production, distribution, exchange, and consumption.

In the relationship between production and consumption, the former is the foundation and controls the latter. It produces the object, form, and motivating force of consumption and determines the nature and level of the latter. Consumption reacts to production and affects its development, because what man produces is finally consumed. In the final analysis, production is for consumption, without which production for production's sake is meaningless and cannot exist. As Marx said: "Where there is no production, there is no consumption. But without consumption there cannot be any production, because in that case production becomes purposeless" (ibid, p 14). To be specific, the reactions of consumption to production may be illustrated as follows:

First, a product proves itself a product through consumption. Marx illustrated the point by saying that a dress becomes a dress when it is worn, while a house without people living in it is not really a house (ibid). Only through consumption can a product establish its identity.

Second, consumption creates a demand for new products. It generates an innate conceptual motive for production and projects the object to be produced. For instance, an increase in the consumption of a given product enhances the production of that particular product. Thus, consumption is the motivating force for and purpose of production.

Third, consumption has a direct effect on the development of production. That is to say, if consumption and production are well coordinated, consumption enhances production. However, if they are dislocated, production will decline and sag as in the economic crises under the capitalist system.

In a word, production and consumption are mutually related and interdependent--the unity of antithesis. Production is the foundation and the premise of consumption, which is the condition and the final objective of production.

The above is an explanation of the general relationship between production and consumption as they exist in any society. However, as production and consumption cannot exist independent of a social system, the nature of their contradictions and the law of their interactions differ under different social systems, and so does the nature of consumption. In a society controlled by the exploiting class, the contradictions between production and consumption are antagonistic, involving class antagonism and conflict. These contradictions can never be resolved under the old system; the only solution is to overthrow the old system through a social revolution. With the means of production controlled by the exploiting class, the workers, kept from the means of production, are compelled to work like beasts of burden for the owners of the means of production, on whom they depend for their jobs and their means of subsistence. The purpose of production under such a social system is for the interests of the exploiting class and not for the needs of the people. Consequently, consumption by the exploiting class and the working people differs in nature and substance.

For instance, since production under the capitalist system rests on the capitalist system of private ownership of the means of production, its purpose is unquestionably for profit. The capitalists make allowances for consumption by the working people only to the extent of the profit it earns for them. Other than this, consumption means nothing to capitalism. The needs of individual workers are simply not within the purview of the capitalists. Thus, under the capitalist system, "individual consumption by the working class means the recycling of purchased means of production in the form of labor force which the capitalists exploit continually. This kind of consumption, a form of means of production required by the capitalists, is in reality the production and reproduction of workers." ("Complete Works of Marx and Engels," Vol 23, p 628). On the other hand, the extravagance of the capitalists "has developed to such an extent that it is accepted to exhibit one's wealth by spending in order to acquire credit--a real necessity to the 'unfortunate' capitalists. Extravagance has become a public relations expense account of the capitalists" (ibid, p 651).

The situation under the socialist system is completely different from that under the capitalist system. Public ownership of the means of production makes the working people the masters of the means of production, to which they are tied in inseparable unity. Consequently, the purpose of production is to satisfy the needs of the working people and raise their level of consumption. Engels pointed out that after the capitalist system of exploitation is eliminated, "social production insures not only that all members of society will enjoy ever-improving and plentiful material livelihood, but that they will also enjoy unrestricted development and use of their physical and intellectual faculties." ("Anti-Duhring," a monograph, p 229). Under socialism, the development of production and the higher level of consumption by the people work in complete accord. The more production develops, the more plentiful the products that are needed to meet the consumption requirement of the people. Improvement of the livelihood of the people, in turn, will arouse their socialist enthusiasm to push for further development of production. This is a mark of excellence of the socialist system as compared to the capitalist system.

In summary, consumption in a socialist society differs diametrically from that in a society controlled by the exploiting class who, basically unconcerned about consumption by the masses of working people, regard it as something like animal fodder or machine oil, which they use to feed those who provide the labor force and create surplus value. Thus, the capitalist class and its spokesmen are not interested in looking for ways to raise the standard of living of the working people. Under the socialist system, where there is public ownership of the means of production, the purpose of production is to satisfy the people's needs and to provide opportunities for them to develop their capabilities. Consequently, the problem of consumption by the working people is so important that it calls for careful study, and it is up to our economists to establish socialist consumption economics.

The Objects of Socialist Consumption Economics

What are the objects in the study of socialist consumption economics? This is a new problem which must be solved ahead of everything else. Personally, I believe the study ought to cover the following three areas:

First, the object of political economy is the study of production relations and the law of their development. Since consumption is one of the four phases of production relations, the primary object of socialist consumption economics should be a study of the consumption relations and the law of their development.

What are consumption relations? They are the relations formed by people in the process of consumption. These relations are closely tied to the forms of consumption determined by the form of production.

In a society where production is founded on private ownership of the means of production, individual families or households are the units of consumption. For instance, under the capitalist system, capitalist families are founded on capital--on a system for individuals to make money. So the capitalists use part of the surplus value earned by exploitation for their families to enjoy extravagant consumption. The proletarians who earn poor wages and buy the cheapest means of

subsistence in order to keep themselves and their dependents alive have to rely on the individual families as consumption units. Due to increasing socialization of production under the capitalist system, even the capitalists find it necessary to run public messhalls, day care centers, and kindergartens in order to exploit the workers more effectively. These are required by the capitalists to intensify their exploitation of their workers and by socialized large-scale production.

Under the socialist system, where there is socialist public ownership and the people are engaged in collective production, socialization of production will expand. This kind of change in the form of production calls for comparable change in the form of consumption, especially the socialization of housekeeping. Consequently, public messhalls, day care centers, kindergartens, new residential centers, etc., under the socialist system are meant to solve the problem of the livelihood consumption needs of the staff and workers as well as of city and town residents. They meet the requirements of socialist public ownership and socialized products, on the one hand, and provide conditions conducive to firm development of socialist public ownership and advancement of socialized production on the other. Although the distribution of consumer goods for personal consumption is based on "from each according to his ability and to each according to his work," and the family is no longer a unit of production, it is still a consumption unit. Consequently, the form of consumption based on the family must be kept even though collective consumption should expand step by step to keep pace with the changes in the form of production in order to speed up the development of productive forces.

Second, socialist consumption economics should study the objects, structure and trends of people's consumption. This is an important problem which we have to study the ways to make improvements.

The objects of personal consumption are numerous, but the principal items are food, clothing, housing, transportation, general purpose goods, cultural needs and services. We must study how to provide plentiful, suitable, sanitary food for human consumption, including staple and nonstaple items. The study should cover also the composition of food and be sure that it contains physiologically required calories and nutrients. As for clothing, we must study how to provide people with enough comfortable and elegant clothing, including styles for different sexes, different age groups, different localities and seasons, personal tastes, and differences in physique and ethnic custom. There should be plenty of clothing in different colors, qualities, and styles for women and children to satisfy their specific needs. As for housing, the study should look into the housing shortage for the working people caused by the old society. The study should cover such problems as the planning, structure, management, and rational distribution of urban housing, the transformation of old villages, and the construction of new residential centers. It is especially important to study urban environmental protection and afforestation to make cities garden-like. More parks and scenic spots are needed for people to rest comfortably after work. A study on transportation should deal with the method of running public transportation effectively and modernizing it, as well as with the problem of privately owned means of transportation. The demand for general purpose goods, cultural needs and services, though numerous, must be met and taken care of so as to satisfy the people's ever-increasing material and cultural needs.

Third, socialist consumption economics should study the relations between consumption on the one hand and production, distribution, and exchange on the other, and the law of their operations.

Marx pointed out: Production, distribution, exchange, and consumption are the four phases which "form the links of a total entity, a unified whole with internal differences." (Introduction to "Critique of Political Economy," a monograph, p 22). "Production marks the beginning, while consumption is the end-result. Distribution and exchange are the intermediary links between the two." (ibid, p 12). Consumption therefore is closely related to production, distribution, and exchange. There is no need to dwell on the relations between production and consumption, which we have discussed above. As for the relations between consumption, distribution, and exchange, Marx said: "Distribution determines the producer's share in the world of products according to socialist laws, and therefore it lies between production and consumption." (ibid, p 17). "Exchange is an intermediary between production and distribution, and consumption is determined by production." (ibid, p 21). These general principles expounded by Marx of course are applicable to socialist societies. Under the socialist system, products have to pass through distribution and exchange before they are ready for consumption--which in turn influences distribution and exchange. Therefore it is necessary to conduct distribution and exchange well in order to satisfy people's consumption requirements, and the satisfaction of people's needs enhances the development of distribution and exchange. Thus, socialist consumption economics ought to study the dialectical relations between consumption, distribution, and exchange and the law of their operations.

In a word, the objectives of socialist consumption economics should cover consumption relations and the law of their development, the objects and structure of consumption, and the relations between consumption, production, distribution, and exchange and the law of their operations. It is clear that political economics, parts of economics, and certain areas of natural science are included. It is indeed a comprehensive science.

The Research Methods of Socialist Consumption Economics

There are fundamental differences and fierce struggles between the Marxist political economy and the political economy of the capitalists, the petty bourgeoisie, and the revisionists regarding the study of consumption.

Capitalist economists do study consumption, but they use capitalist methods to study it from a capitalist viewpoint and position, so as to defend and serve the capitalist system of exploitation. For instance, some capitalist economists place production, distribution, exchange, and consumption on an equal footing (this might be called the "four-quarters method") and repudiate the decisive role of production, which is a basic principle of Marxist historical materialism. Some capitalist economists concentrate on studying personal consumption (actually the wasteful extravagance of the capitalists) and advocate "welfare economics" in the guise of "social welfare." Approaching the matter from an idealist viewpoint, some capitalist economists regard the happiness of the capitalists as the happiness of the whole society, advocate capitalist utilitarianism as being above class differences, look at consumption as a subjective personal desire, and refute the decisive influence of production on consumption and the objective relations between production, distribution, exchange, and consumption. Other capitalist

economists want to raise the level of consumption to eliminate class struggles, claiming that "ideal consumption promotes worldwide cooperation" and that "high-level consumption reduces conflicts between individuals, wipes out class struggles, and helps mankind achieve a universal state of harmony." Keynes, a spokesman for the monopolist capitalists, advanced the so-called "law of psychological propensity for consumption" not only to blot out class differences in consumption, in his defense of the intrinsic failures and crises of capitalism, the parasitic consumption by the monopolist capitalists and their state, and the arms race, but also to stimulate personal consumption to eliminate economic crises and save imperialism from its inevitable destruction. But the fallacies of these capitalist economists have not been able to withstand Marxist political economics on the one hand and the realities of capitalism on the other.

Petty bourgeois economists are especially interested in distribution and consumption. Opposed to the capitalist system of distribution and the wasteful extravagance of the capitalists, they advocate "equitable" distribution in order to satisfy "those needs which come with one's birth" (in the words of Sismondi). Although they have contributed heavily in exposing and attacking the capitalist system of exploitation, their own bourgeois position and viewpoint are not effective enough to hit home at the capitalists. Their proposals for resolving the contradictions in capitalism are mostly visionary or even reactionary. For instance, they believe the trouble with the capitalist system of distribution and consumption is overproduction rather than the capitalist system of private ownership. Consequently, they favor curtailment of production and "equitable" distribution (in reality equalitarian distribution) and restricted consumption. Their approach is based on an idealist and metaphysical concept opposed to historical materialism. If we acted on the strength of these views, we would turn the clock backward and return to a state of small-scale production. That is why we say these views are regressively reactionary.

Revisionist economics is a variety of capitalist economics. Defending and serving the capitalist system from the capitalist viewpoint, these [revisionists] have advanced a number of fallacies about consumption. The older school of revisionists believe that the only way for the proletariat to enhance their material well-being is "to cooperate" with the capitalists. They favor economic struggles by the proletariat but oppose political struggles, especially violent revolutions. Contemporary revisionists, however, advocate the theory of distribution determinism, and they use such slogans as "Everything for man and his happiness" to win popular support. Treating personal material interests as an important or even the only motivating force in developing production, they rate such interests above everything else. While advocating both personal and national self-interest, they pay only lipservice to proletarian politics, the Marxist principle of revolution, and proletarian internationalism, which they have abandoned in practice. Acting against these principles, they have turned the first socialist country into socialist imperialism.

The economics cooked up by the "gang of four" and their hack writers is simply a hodgepodge of feudalism, capitalism, and revisionism based mainly on the reactionary viewpoint of the petty bourgeoisie. "Holding high" the banner of 'revolution,' they gave a "leftist" revision to Marxism-Leninism and Mao Zedong Thought. Not the least concerned about the hardships of the people, they repudiated

material benefits and opposed raising the people's level of consumption. Advocating a fallacious theory that "the poor are for revolution; the rich favor revisionism," they resorted to petty bourgeois equalitarianism to practice the "socialism" of poverty. They opposed better welfare for the people, which they branded as "welfarism." They also opposed the development of productivity, and called the four modernizations capitalistic. The disruption and destruction by the "gang of four" have driven our national economy to the brink of collapse, seriously jeopardized production, and lowered the people's standard of living. The "gang of four," a bunch of fake revolutionaries, are the deadly enemies of the people of the whole country. We must criticize the fallacies they have disseminated and weed out their pernicious influence.

Proletarian political economists should adhere to the proletarian stand and employ the viewpoints and methods of dialectical materialism and historical materialism to study the problem of consumption under the socialist system in the light of socialist reality. Instead of following after the capitalist economists, who give equal weight to production, distribution, they should accept the decisive role of production and proceed with the dialectical relations between consumption on the one hand and production, distribution, and exchange on the other, so as to tackle the problems of socialist consumption economics. They must not follow after the petty bourgeois economists, who emphasize equalitarianism and restricted consumption rather than develop production. Nor should they follow after the contemporary revisionists, who rate personal material interests above everything else, do not adhere to proletarian politics, and violate Marxist principles. They must be especially careful not to follow after the "gang of four," that most detestable bunch, who advocate the "socialism" of poverty and undermine the integrity of socialism. If people say that the methodology of the capitalist economists is useful in analyzing consumption, that the petty bourgeois economists may claim some credit for exposing the contradictions of capitalism, and that people may derive some temporary benefit from the emphasis placed by the contemporary revisionists on personal material interests, then we must say that the fallacies and methods of the "gang of four" are responsible for massive disruption of production, drastic reduction of consumption, and social regression. In a word, these are absolutely reactionary fallacies and counterrevolutionary methods, and they are diametrically opposed to the principles and methods of the proletarian political economy.

Furthermore, since socialist consumption economics is a comprehensive and complicated academic discipline, its methods include not only scientific abstractions but also methods used in certain areas of economics and those used to study natural sciences. There is no other way to build up and enrich socialist consumption economics. To this end, we must organize all related sectors to work together under the leadership of appropriate state organs to prepare writings based on research, investigations, and summarizations of experience in order to lay the foundation for the establishment of socialist consumption economics.

ECONOMIC PLANNING

'GUANGMING RIBAO' ON EFFECTS TO MATCH WORKERS' SKILLS, JOBS

OW241238 Beijing XINHUA in English 1225 GMT 24 Sep 80

[Text] Beijing, 24 Sep (XINHUA)--New job opportunities are opening for qualified people as efforts are being made to match skills with work, according to today's GUANGMING DAILY. Work in new China has been assigned by the government and in some cases the best points of people are not used. It is not easy for a person to get transferred to a more suitable job. The governments of many provinces realize this and are beginning to take steps to change the situation.

Personnel departments of 14 provinces have investigated the foreign language potential. In some places, public notices were posted and examinations given. Up to now 6,533 people have been given work in various foreign languages. Of these, 2,574 were transferred from jobs that did not use their language skills, and 3,959 are newly employed. Many young people who went down to the countryside studied foreign languages on their own and have become quite proficient. They are being given work as interpreters and in foreign trade.

Another report says that LIAONING DAILY now carried columns to help those who want a job transfer. A feature article in the paper today tells how Sujiatun District of the northeast China city of Shenyang discovered people of ability to develop its economy. Sujiatun is a remote suburb of Shenyang city. The district's agriculture is fairly developed and modernization has left the district with a surplus labor supply of 15,000. The district wanted to set up industry but lacked technicians and engineers. In July, the district communist party committee set up a reception station for people with special skills. After interviews, it recruited 117 able people and the search is still continuing. The district pays the fares for everyone it invited to come to the center for an interview. With new technicians and engineers, a paper mill and a chemical works in the district were able to improve the quality of production. An engineer who is an expert in knitwear was transferred to this district and is now head of a newly set up small knitwear factory.

CSO: 4020

FINANCE AND BANKING

ROLE OF TAX REVENUES FOR FOUR MODERNIZATIONS DISCUSSED

Beijing CAIZHENG [FINANCE] in Chinese No 4, Apr 80 pp 19-21

[Article by Zhang Hua [1728 5478]: "A Discussion on the Role of Tax Revenues in the New Period"]

[Text] This is the second year in which the party's work has focused on the construction of the four modernizations. The whole party and the whole people must work for this central task. The same is true for tax revenue. In order to develop a better role for tax revenues in this new period in history, the following problems must be resolved.

I. Tax Revenues Must Be Stable

During the 30 years since the founding of the state, understanding of tax revenue has been very inconsistent. Sometimes it is said to have a major role and sometimes not. As a result, the ups and downs of tax revenue work has also been great, which has had a certain effect on its role in socialist revolution and socialist construction.

During the war years and the early period of the founding of the state, tax revenues, which were used to assure war provisions and to restrict and transform capitalism, made a lasting contribution. This is known by all, and their role is definitely clear to everyone. However, after the basic completion of the transformation of the system of private capitalist ownership of the means of production, a divergence of views about tax revenue developed. This divergence reached a peak during the Great Cultural Revolution. After 1958, some people felt that since the structure of our national economy had undergone fundamental changes, with enterprises now belonged to the system of ownership by the whole people and the system of collective ownership, tax revenue had become quite unnecessary. They felt that taxes or profits from state-run enterprises all belonged to the state in any case, so that it was not necessary to differentiate them into two forms of payment. Even without tax payments, the money would not go abroad. It was as if tax revenue had completed its historic mission and had become redundant. At the same time, with the storm of a great financial reassignment, tax organs were removed and merged, and there was great reduction in the number of revenue staff members. Measures like the three self-handled taxes (self-declaration, self-payment, and self-examination) were carried out, weakening tax revenues and greatly affecting state revenue. Beginning in 1962 there was an awareness that this was unfavorable to the state, but just when the strengthening of tax revenue work became necessary, the Great Cultural Revolution started. Under the interference of the "gang of four's" ultraleftist line, the

clamor was for the abolition of tax revenue, which was regarded as the dictatorship of rules and regulations, and as economic shackles. The feeling was to have tax revenues abolished altogether. Thus once again the imperfect tax organs underwent removal and merger, and tax revenue work was freely simplified. No one questioned the state of tax policy and its execution, and tax revenue work became chaotic. Today, since the smashing of the "gang of four," the Party Central Committee, under the leadership of Chairman Hua has emphasized the development of the pivotal role of tax revenue to revive the prominence of its work. But present understanding of the role of tax revenue is still not unanimous. Some people are still apprehensive whether tax revenue can be stable for a relatively long time. It is very unfavorable to our tax revenue work if this problem of understanding is not resolved. It is necessary that we understand this important problem from theory to practice.

Marx and Engels said: "What follows the abolition of taxes and levies is the abolition of the state." I think these few words clearly explain the theoretical foundation of tax revenue and its necessary existence for a period of time in history. Tax revenue came about with the state and exists with the state. Therefore, as long as the state exists, we cannot be without the instrument of tax revenue. This is an objective economic law which does not change with the people's will. Tax revenue serves different classes in different social systems, and such has been the case since ancient times. The ancients said, "The imperial grain is the kingdom's revenue." No dynasty could do without it; slave society, feudal society, and capitalist society all have it, and even today's socialist society cannot do without it. In my opinion, it is indispensable until communism becomes a reality. Of course, tax revenue systems and what they serve have varied in different periods. In a society ruled by the oppressive classes, tax revenues serve the oppressive ruling classes. In a country ruled by the dictatorship of the proletariat, tax revenues serve the dictatorship of proletariat. Tax revenues in the old society took from the people for selfish ends. In the new society they are taken from the people and spent on the people. This is the essential difference in tax revenue under the two different social systems. Not distinguishing this point is to muddle our mentality.

Viewed once again from practice since the founding of the state, tax revenue plays a role regardless of whether a privately run economy or a socialist economy dominates. No doubt, different demands in tax policy are called for in dealing with different kinds of economy. Our tax policy always proceeds from the maintenance and development of public ownership. Under the socialist system, even if a socialist economy takes command, socialist commodity production and currency exchange still exist, the role of market regulation under state plans still exists, the law of value still exists, and state financial accumulation still exists. Tax revenue as the economic pivot of the state still needs to play its role, and all the more so as it should keep pace with the demands of the national economy and realize the four modernizations. This means developing the regulatory role of tax revenue. We must earnestly study and fully develop its role in this respect. The view that tax revenues become optional after the transformation of the system of private ownership of the means of production has no theoretical basis and is not in accord with the actual conditions in our country.

II. Tax Revenues Must Advance

Whether tax revenues should advance or retreat has been a question of endless debate. In other words, it is a question of which form of revenue payment better suits the economic foundation and the demands of high-speed financial accumulation of the state. Some suggest that taxes should be unified, and as revenue payment from state-run enterprises has no real meaning [a system of] profit tax payment should be entirely adopted. Some also suggest that taxes should suit the needs of economic development, that whatever types of taxes need to be collected, should be collected, and that tax revenues should be applied to the accumulation of state-run enterprises. Thus the debate opens up. It concerns the future development of tax revenues and the place and role of tax revenues in national economic life. It also concerns the question of tax reform proceeding from our country's present economic conditions. One thing is certain: failure to resolve the question of whether tax revenues should advance or retreat will directly affect the question of how big a role tax revenues should play in order to suit the needs of the construction of the four modernizations.

I think we should examine, observe, analyze, and study this on the basis of practice. To debate without discussing practice is fruitless. We can use the three following questions to make some comparisons.

First, should there be more or fewer tax categories? This kind of suggestion is actually ambiguous. Tax categories cannot be subjectively assumed but depend on economic conditions. If the economic system is unitary, then we can only use a unitary tax category. If the economy is complex, then multiple categories of taxes should be used. This is the only appropriate way. The revenue system is a super-structure which must suit the economic foundation. Otherwise, unfavorable effects will be brought upon the economy. For example, in the early period of the founding of the state, five economic components existed in our country (a state-owned economy, a collective economy, a capitalist economy, a joint public and private economy, and an individual economy). With this complex economic situation, multiple categories of taxes and more frequent collection were adopted--14 tax categories, at one time. After the three great transformations, the economy moved toward a unitary system and essentially there were only two economic components, a socialist state-owned economy and a collective economy. To suit the situation, some tax categories were necessarily merged, though some were oversimplified. At present, there are only eight categories of taxes. In accelerating the development of the construction of the four modernizations, economic components have increased and the current categories of taxes are no longer suitable. The main economic components in our country at present are the state-owned economy and the collective economy, but a joint economy and an individual economy have also appeared. In particular, the development of foreign trade not only involves varied forms of economy, but it must use the principles of defending state sovereignty and reciprocity to safeguard our country's economic interests. Therefore, internal as well as external consideration must be given when designing a revenue system. Thus it is necessary to revive some tax categories and establish some new ones. Current categories of taxes must also be improved to suit a more developed economy. When the industrial and commercial tax was reformed in 1972 under the interference of the ultraleftist line of the "gang of four," it was thought that the fewer tax categories the better, so they were forcibly merged. Not only were the real property tax, the vehicle and shipping license tax, and the tax on slaughtering animals merged with the industrial and

commercial tax, but the salt tax was also forced into it. Called by the nice-sounding label that reduced tax categories benefit the development of production, this actually violated objective economic laws. For instance, the salt tax is a special category collected at a fixed rate, and it is entirely different from the industrial and commercial tax, which is paid according to the products and tax rate on the turnover. Although the State Council issued industrial and commercial tax regulations, these did not work in practice, and it could only continue to maintain the external collection of the salt tax. Also, when the industrial and commercial tax was changed to a service trade tax unrelated to products, it denied the industrial and commercial tax as a price component and it suffered various restrictions. Later there had to be a gradual return to the tax on products. Practice tells us that study and reform of the revenue system require us to proceed from the objective economic situation and the demands of national economic policy. Otherwise, we will not be following materialism.

Second, can the accumulation of state-run enterprises be paid to the state in the form of a profit tax? There are two views, one in agreement and the other in disagreement. The latter view reasons that it is not logical to turn the profits of state-run enterprises into a profit tax payment. I suggest the former view. To accelerate the realization of the construction of the four modernizations, the Third Plenary Session of the 11th Party Central Committee decided that, henceforth, enterprises' right of free choice must be expanded. In changing the present fiscal system, a state-run enterprise is an independent accounting unit which needs to have the right of free choice in expanding production. This is a question that requires our careful consideration as to how finance can suit this new situation. Viewed from the advantage of enterprises' free choice and planning, tax revenue is still more appropriate. Because tax revenues have rates and payment periods, enterprises can know beforehand how much profit they can generate in a year, how much should be paid to the state, and how much should be left for themselves. Enterprises can consider when they might need money, the amount needed, and what they have to spend. To facilitate enterprise's acting on their own, they actively and in a planned manner make appropriate arrangements for their own production development plan and welfare facilities. At the same time, tax revenues are determined by law and are concrete, which is a reliable safeguard for organizing state revenue. After the change to profits tax for state-run enterprises, revenue departments will become concerned with enterprises in their realization of their profits and will look into these enterprises to strengthen financial supervision, promote economic accounting, and urge them to conduct their work strictly according to the provisions of state revenue laws and the system of financial affairs. This kind of revenue system is therefore suitable for economic development and is theoretically sound.

Of course, changing the form of payment for state-run enterprises should undergo investigative study and experimentation, and it should be promoted only after experience is obtained. Having state-run enterprises pay profit taxes is an important reform and touches on many questions. We cannot look upon complex problems in an overly simplified fashion. Improper handling of a good system could generate unfavorable results.

Third, should we use a single form or a multiple form of payment to collect the accumulation of state-run enterprises? Which form of payment is more favorable to satisfying the needs of construction funds for the four modernizations? On this question, I strongly agree with Comrade Yu Guangyuan [0060 0342 6678] that we have

to adopt the method of a unified and not a dual system. The so-called unified system means a tax revenue form of payment, while the dual system means using both tax revenue and profit forms of payment. Comparing the two, I consider tax revenues an important economic measure which better suits the needs of the construction of the four modernizations. It urges enterprises to strengthen economic accounting, helps to guarantee state revenue, and strengthens financial supervision. We know that the financial demands of the four modernizations are for quantity and stability. Tax revenues possess these characteristics. Compared to the profits form of payment, they are timely, safe, and reliable, and can survive risks.

III. Tax Revenues Must Be Strengthened

Since tax revenues have become the chief source of the budget, it is necessary to strengthen their construction in terms of ideology, system, and organization--areas which at present are extremely unsuitable. The question of ideological construction has already been discussed. Here, we emphasize the construction of system and organization.

The present tax revenue system is fragmentary and lacking in legality. The current industrial and commercial tax and the industrial and commercial income tax are two main taxes, both trial regulations which have not gone through formal legislation. The old taxes, such as the industrial and commercial unification tax and the industrial and commercial income tax from the industrial commercial taxes, continue to be applied toward foreign countries; the individual income tax, which has already been an issue, and the fixed property tax determined by the State Council have not been enacted with specific regulations for their implementation. Besides, some ideas on taxation are still being investigated and studied. This does not suit the demands of the four modernizations. Regulation No 121 of the Legal Code specially deals with violations of the tax law. Here we have to resolve what kind of law is being violated. In order to have laws, we must strengthen investigative studies, speed up the legislative process, and guarantee state income by law against violations.

The tax organization is the functional organ that carries out the tax laws of the state. As the situation develops, the task of tax revenue will become arduous, and this work cannot be guaranteed without a special tax organization from central to local levels. The establishment of a revenue staff should also be unified by the central authorities according to work requirements. The tax revenue staff must be stable without being freely transferred, because it takes at least 5 years to train a relatively experienced revenue staff member. We also need to have special schools to train revenue staff, who must have titles. A system of revenue specialists and an assessment system must be established. And all this must relate to the economic benefit of individual staff members in order to make them red and expert, capable of contributing to the four modernizations.

ENERGY

SOURCES OF ENERGY FOR MODERNIZATION DISCUSSED

Beijing ZIRAN BIANZHENGFA TONGXUN [JOURNAL OF DIALECTICS OF NATURE] in Chinese No 2, Apr 80 pp 16-22

[Article by Xu Junzhang [5171 0193 4545], Zhang Zhengmin [1728 2973 2404], Yang Zhirong [2799 1807 2837] and Zhu Bin [2612 2430]: "On Energy Construction for China's Modernization"]

[Text] Correctly Estimating the Energy Situation

Human society is built on immense energy consumption. The more society develops and the higher the degree of modernization, the greater the amount of energy consumed. Inadequate energy supplies emerged early in human history, but the appearance of the "energy crisis" dates from the last 10 years and is one of the imbalances that appear when human society is at a high level of development. In the 1950's, as a result of the discovery of large oilfields in the Middle East, the energy resource requirements of social modernization, and the competition of the Western nations for cheap oil, oil gradually replaced coal as the main source of energy. By 1973 oil already accounted for half of worldwide energy consumption, reliance on oil by the developed nations of the world had already reached a startling level, and an economic system where oil was the prime source of motive power had already developed. Accordingly, the brief oil embargo during the Middle East war which broke out that fall made such countries as the United States, France, West Germany, Italy and Japan, which relied on Middle Eastern oil, suffer economic disruption and threw people into confusion. Japan's national economy not only was unable to maintain the previous year's 10 percent growth rate, but actually experienced a drop of 2 percent while the gross national product dropped by almost 50 billion US dollars. The United States lost more than 90 billion dollars, and the economy stagnated. When Jimmy Carter was running for president, he made the accusation that "the Ford administration's failure to pay adequate attention to the energy problem was its most important failure," which won him many votes. The economies of other nations also experienced negative growth. The warning bells of the energy crises were becoming deafening.

The energy crisis is not the result of exhaustion of energy resources. But the emergence of the energy crisis caused people to take stock of petroleum, natural gas, coal and other energy resources. It has now been confirmed that world recoverable petroleum resources will last only 34 years at the current production rate. It is predicted that oil production rates will peak at about 1990, after which they will decline. Total reserves of natural gas are very limited, and they are

expected to reach their peak 10 or 20 years after petroleum, then drop. Although coal reserves are plentiful, and can meet mankind's needs for 200-300 years, because of environmental protection limits, coal production will also peak during the next century. People disagree as to whether there will then be a temporary hiatus on the energy stage, or whether there will be some extraordinary occurrence. Some people estimate that the real energy crisis will come about 1990, when there is grave shortage of petroleum; this crisis will be worldwide. Accordingly, a scientific estimate of petroleum situation and the elaboration of a far-sighted, practicable energy policy are becoming increasingly urgent.

What is this country's energy situation? Since the state was founded, our country's energy production has increased 25 times, a major achievement which has brought our country's energy consumption up to third place in the world. But as in many countries, our energy production still cannot satisfy the requirements of production and daily life. In particular, our country's population is immense, our energy utilization efficiency is low and there is serious waste which is continuing to put pressure on supply-demand relations. Several years ago, when our country's energy shortage was already apparent, the west's energy crisis was called an "evil of capitalism" by the "gang of four" and their like, who said that "socialist China has no energy crisis." A three-foot freeze takes more than one day's cold. Currently our country's energy shortage shows up in concentrated form in: insufficient motive power for industry, an inability to guarantee electricity for municipal domestic uses, and insufficient firefuel in the countryside. Because of insufficient motive power, about 30 percent of industrial productive capacity cannot be brought into play, which is already markedly influenced the development of the national economy. The energy situation is an urgent one.

Two figures are used in discussing energy resources. The first is total energy, an absolute quantity; the second is the per capita average, a relative value. This country's hydroelectric resources are first in the world. Our coal resources are third in the world, behind only the Soviet Union and the United States. Our oil resources are seventh in the world. In addition, we have a wealth of natural gas, and so on. But in terms of the per capita average, we are relatively poor, poorer than the Soviet Union and the United States, and below the mean world per capita figure. But compared to Japan, France, Italy, India and other countries, we are much better off, and we can still be called an "energy-rich" country.

Energy is the Material Basis of Modernization

Energy and human production and daily life are linked together. Historically, human society has passed through three energy periods: the firewood and grass period, the coal period and the petroleum period. Man began his utilization of energy with his discovery of fire, but the level of development of the productive forces in the period when wood and grass were used as the main energy sources was very low. During the immense industrial expansion brought about by the Industrial Revolution in the 18th century coal replaced wood and grass and gradually became the main energy source; social productive forces experienced an amazingly great expansion. By the 1930's, coal's predominant position began to be shaken, and the period in which oil would be the primary source approached. Within nearly a quarter of a century, many countries have come to rely on petroleum and natural gas, have created a brilliant material culture unprecedented in human history, and have carried out social modernization.

In general terms, growth of the national economy requires corresponding growth of energy resources. However, the relation between the rate of growth of energy consumption and the rate of growth of gross national product, i.e., the "energy elasticity coefficient," also known as the "energy consumption growth coefficient," is extremely complex. It is related to many factors such as the structure of the national economy, technical facilities, the standard of living and the like. In the period 1880-1920 when the United States was turning from agriculture to industrialization, its energy consumption growth coefficient was 1.65; for postwar Japan in 1955-1960 the coefficient was 1.27. If we analyze data for the main industrial countries, we find the following: in the initial period of industrialization, because industries with high energy consumption have arisen, the energy consumption growth rate is always faster than the rate of growth of gross national product, so that the ratio is greater than 1. But in the period from 1950 to 1975, because of the advances of science and technology, changes in energy structure and the structure of the economy, and energy-saving industries developed very rapidly, the energy consumption growth coefficient always dropped, generally to about 0.8.

In our country in the 25 years between 1953 and 1978, energy consumption has increased 9.5 times, and the gross national product has increased 5 times, so that the ratio between the two is 1.22. During this period, we mainly developed energy-intensive heavy industry, the chemical industry and the like. At the same time, our technological facilities and processes were relatively backward, most of them equivalent to the 1950's level abroad, energy consumption per unit product output was high, and the nationwide energy utilization efficiency was only about 30 percent.

In order to carry out the four modernizations in this century, should our country's energy consumption growth coefficient be large or small? This should be analyzed from many view points. Our country's industry has already acquired a certain foundation, and in the process of modernizations it will carry out technological transformation and reequipping of existing enterprises, will decrease energy consumption per unit output, and will increase the rate of effective utilization of energy; newly-created enterprises will use advanced technology and efficient production processes, and the product energy consumption will be much less than for older enterprises. The process of readjustment of the national economy, will make our country's industrial structure more rational; we use our energy very inefficiently and with shocking waste, and there is great potential for conservation. The amount of energy consumed in agricultural production is currently very small, but as agricultural modernization is implemented, the amount of energy consumed per unit of agricultural output value will increase. The raising of the people's standard of living will also steadily increase energy requirements, but the amount of energy used in agriculture and daily life will account for only a small proportion of energy consumption. If we examine the energy production and consumption experience of the world's main industrial countries during modernization and summarize these factors, we conclude that it is not necessary that the energy consumption growth coefficient for our country's modernization be especially large; it may be about 1, or even a bit less.

This is not at all to say that we do not need a large increase in energy production. Quite the opposite, any process of modernization must consume a relatively large amount of energy; particularly when carrying out universal mechanization, electrification and automation, energy requirements increase steadily. Social modernization is based on immense energy consumption. In the first 25 years of the last half-century, the world's energy consumption increased by only 70 percent. In the second

25 years, when many countries of the world were carrying out modernization, energy consumption increased rapidly, more than tripling. In modern production, energy sources not only represent fuel and motive power, but also are important industrial raw materials. The plastics industry, the synthetic fibers industry, the synthetic rubber industry and the like all use energy resources as raw materials. As modernization is carried out, the people's standard of living will also gradually be raised, people's clothing, food, dwellings and transportation will require increased energy resources, and consumption will increase continuously. But the estimate that the energy consumption growth coefficient will not be greater than 1 has important implications: first, our future energy production will have to be more realistic; second, we do not have to strive for excessively high energy consumption figures, but can set a relatively objective standard for our modernization.

But what kind of energy resource figures should we attain in carrying out our country's modernization? We believe on the basis of our country's specific circumstances that if yearly per-capita energy consumption in this country reaches 2 tons of standard coal, this can be called preliminary attainment of modernization. What will the modernization standard of living be like at that time? We have made a rough estimate that if 70 percent of energy consumption is used in production and 30 percent in daily life, the national product will be about 4-5 times what it is now, the urban housing problem can be basically solved, each person can have an average of 10 square meters of space, each household can use about 1,000 kilowatt-hours a year, every family can have some essential electrical equipment such as an electric refrigerator, electric fan, washing machine and the like, gas and central heating can be provided, and some households can even have a higher consumption level, including a small private automobile and the like. The countryside can be basically developed into cities and towns, with a much higher standard of living than in present-day cities and towns.

Is it possible to attain this level in this century, i.e., an annual per capita consumption of 2 tons of standard coal? Our answer is yes. In 1978 our country's energy consumption was 570 million tons of standard coal (not including rural animal energy sources), a per capita average of less than 0.6 tons. By the year 2000, we estimate that our country's population will have increased to 1.2 billion, and figuring 2 tons a person gives 2.4 billion tons, 4 times the current figure. In the next 5 years, while our country is in a period of readjustment, it is expected that the increase in energy resources will not be very great, but in the last 5 years of the 1980's, we may expect that energy resource production will expand somewhat, while we will also be making preparations for the next step in development; in the 1990's, however, we will be able to move forward rapidly.

The Technological Route to Energy Construction For Modernization

Our modernization will rely primarily on conventional energy sources. Conventional energy sources include petroleum, natural gas, coal and hydroelectric power, which constitute the majority of energy, and which are the energy sources currently generally used in production and daily life. In 1978, for example, worldwide energy production was about 10 billion tons of standard coal; conventional energy accounted for 97 percent, with the other 3 percent being new energy sources such as nuclear and solar power. In terms of our country's circumstances, solar power, methane, geothermal power and tidal power can amount to only an insignificant part of our total energy consumption: conventional energy resources are almost 100 percent of our sources of energy. This predominance of conventional energy sources is

not expected to change during this century or over an even longer period. Although conventional energy sources are limited, the reserves of petroleum and natural gas will at least not be exhausted during this century, and the lifetime of coal utilization will be longer. Our country's coal reserves can be utilized for 300 years. The emergence of the worldwide energy crisis is forcing people to actively develop new energy sources, but in technological terms alone, it will take a relatively long period for new energy resources to replace conventional ones. Such countries as the United States, England, Japan, France, West Germany and the Soviet Union are relying on conventional energy sources for their current industrialization and modernization. This applies equally to our country.

Petroleum is the most precious of energy sources, and /in developing conventional energy sources we cannot slacken our effort in petroleum./ The development of the Daqing oilfield via our country of the "energy-poor" label. From liberation to the present, great achievements have been attained on our country's petroleum front. But because our country's geological exploration capability is weak, we have not been able to keep up; in addition our thinking has been excessively optimistic, and our estimates of petroleum reserves have been too high. Recently, while our petroleum reserves had not been fully ascertained, and it became apparent that these reserves were insufficient, some comrades began to have doubts regarding our petroleum future. It is true that underground reserves of petroleum are nowhere near as rich as those of coal worldwide. But our country's situation is that our geological exploration has been concentrated mainly in the Northeast and North China, accounting for 20 percent of the areas with reservoir structures, while 80 percent of the area still has not been worked on. Some people estimate that worldwide there can be no more oilfield discoveries like those in the Mideast; but in China we cannot rule out further discoveries of fields similar to Daqing. If this happens it will make a great contribution to solving our country's modernization energy resource problem.

Can we make the inference that while such countries as the United States, England, France, Japan and West Germany carried out their modernization in the last 20-30 years on the basis of cheap petroleum resources, we will be carrying out China's modernization on the basis of our own petroleum and coal resources over a somewhat shorter period? The course of history may prove this inference correct.

Petroleum is an excellent fuel. Actively strengthening this country's petroleum geology work and extracting and using our petroleum scientifically are important aspects of this country's energy policy. Currently the replacement of oil by coal worldwide is based on the shortage of oil and the rapidly increasing price, but in this century the predominant place of petroleum will not be altered. In developing our country's energy policy, we should take account of the shortage of petroleum sources but should take into account even more the importance of petroleum for modernization. We should do everything possible to find new petroleum resources so that our country's energy structure can be more advanced. We should operate with respect for objective economic laws; in the complex realm of economics we cannot guide everything by a few simple slogans. A few years ago, when we thought we had a great deal of petroleum, we stressed the use of petroleum as a fuel, but a single power plant conversion cost a few hundred million yuan. If we now change over from oil to coal, we will have to spend a few more hundred million yuan. In the current situation of petroleum shortages, we should cut back on our use of oil, but past economic lessons are worth bearing in mind.

From now on we must bear in mind that /we must utilize coal on a new technological level./ With petroleum in short supply the path to solving our energy problems will be increased extration and utilization of coal and vigorous development of

nuclear power. Faced with this prospect, the view has developed that our current modernization work relying primarily on extracting and utilizing coal would allow us to avoid the tortuous historical path of many countries which converted from coal to oil and then converted back from oil to coal. This view is one-sided. Future coal use will not be the previous simple burning of coal, but will take the route of coal gasification and liquefaction, processing the coal into gas or liquid fuel and using it like petroleum or natural gas. If we say that the coal-oil-coal route is reality, then this coal cycle is not a mere mechanical reintroduction, but instead a reappearance at a new level.

We submit that we cannot maintain the current state of affairs in coal utilization. Consider the environmental pollution caused by our country's current burning of coal: this year we are burning 600 million tons of coal and producing 120 million tons of ash, 20 million tons of fly ash, and 12 million tons of sulfur dioxide gas, all of which are borne away and dispersed over the cities and countryside of the entire country. The result is serious environmental pollution, and none of the country's more than 1,000 cities and towns, including such famous scenic spots as Hangzhou and Guilin, has attained the international environmental protection standard. If this continues we will be unable to set up a clean modern state. Moreover, our country currently uses considerable quantities of low-quality coal, and many inhabitants of the country's cities and towns use coal briquets with even larger quantities of ash. We must immediately begin to improve our methods of coal utilization, raise our coal use efficiency, extract and use more high-quality coal, and carry out coal gasification and liquefaction--all of which are effective methods. Coal gasification by cities should also be put on the agenda.

In energy construction for modernization, /we should expand the electric power industry beyond the former level./ Electric power is used extensively in all departments of the national economy and is one of the main yardsticks of the modernization of production and daily life. Worldwide, energy consumption for electric power production amounts a quarter of all energy consumption. In the modernization process, the development of the electric power industry has been relatively rapid all in all countries. In the last 20 years, the ratio of growth of electric power consumption to the growth of the gross national product has always been greater than 1, and several of the main industrial countries average about 1.5, with the figure exceeding 2 in the United States. In the same period, this ratio has reached 1.8 in our country, indicating that the electric power industry in this country is developing rather fast. In 1978, electric power consumption accounted for 22 percent of total power consumption in our country. Electric power production can be carried out on a large scale in centralized fashion, and long-distance power transmission is generally rather superior, in addition to which use of electric power has the advantages of employing simple equipment and having a high conversion efficiency. As development of the four modernizations proceeds, the energy requirements of production and daily life will increase greatly. Our country's current energy shortfall is strikingly expressed in its insufficient supply of electric power.

Electricity is a secondary energy source which must be obtained from a primary energy source such as coal, petroleum or water power. In the future, as the power industry develops, water power will be developed as rapidly as possible, in keeping with the nature of our country's power resources. This country has the world's richest water power resources, and at present only 2.5 percent of our usable resource have been developed. The eastward flow of the mighty rivers is a flow

of coal and oil. Starting in the 1920's, many of the world's industrially developed countries have spent half a century of effort on hydroelectric power development, and have constructed hydroelectric power stations of all sizes, so that it is the most intensively developed primary energy source; but economical exploitation of the water power resources in many countries, such as France, Italy and West Germany has already reached the saturation point. For every 1 percent of its power resources that our country develops, it can obtain 4.5 million kilowatts of electric power capacity, equivalent to extracting more than 10 million tons of coal. Hydroelectric power is thought to require a large investment and a long construction cycle; however, these are not intrinsic shortcomings of hydroelectric power construction, but rather common problems of all power industries. In constructing a coal-fired power station, if the costs of coal mine investment, transport investment and expenses for municipal construction associated with an increased work force are figures in, the expense will not necessarily be less than for hydroelectric power, and the construction cycle will not necessarily be shorter. If hydroelectric power is developed well it will not only require a smaller investment, but can be done faster.

(Energy construction must be far-sighted.) The current world population is 4.4 billion, and it is predicted that by the next century it will increase greatly, so that energy consumption will increase severalfold. Using a conservative estimate, in the year 2000 total world energy consumption will reach 20 billion tons of standard coal. Where will this immense quantity of energy come from? This problem requires that our consideration of energy questions be far-sighted.

The utilization of nuclear power has opened a brilliant prospect for the development of human production. Many countries believe that shortages in world energy supplies can be made up by nuclear power. Such countries as the United States, Japan and the various nations of Western Europe have already made development of nuclear power a national policy, and have speeded up its development. It is expected that by the year 2000 nuclear power will account for 13 percent of world energy consumption, and may amount to more than a quarter of total consumption in the United States. The nuclear industry has already developed into an immense industrial system worldwide; the existing 200-plus nuclear power stations in the world have a total capacity of 110 million kilowatts, while 300 stations are currently under construction or being designed, and by the end of the 1980's capacity will reach 400 million kilowatts. Light water, heavy water and graphite-moderated gas-cooled reactors are already operational on a commercial scale. High-temperature gas-cooled reactors and fast neutron breeder reactors have already been successfully developed and expected to increase nuclear power utilization efficiency by several dozenfold. As science and technology progress farther and farther, new nuclear technology is making uranium and thorium reserves adequate for human needs for more than 10,000 years. Our country was the fourth in the world to explode a nuclear bomb, but it still has not set up a nuclear power plant of its own. This country's conventional power sources are very unevenly distributed, and the development of nuclear power in areas whose economies are relatively well developed but which lack energy resources and are far from fuel production areas will be of special importance in solving their energy problems. Our country already possesses the conditions for developing nuclear power, and it should do vigorous planning work, intensify its research, make a strong effort in nuclear safety technology, decrease the cost of constructing nuclear power stations, and make the effects of nuclear power felt in this country as soon as possible.

Even if such energy-rich countries as the United States devote all their energy to developing nuclear power, the immense energy shortfall still cannot be made up. The Carter administration's energy plan proposes that by the year 2000 such renewable energy resources as solar power should account for 20 percent of US energy consumption. Solar power, wind power, biomass power, ocean power and geothermal power not only have immense potential, but are clean. In terms of energy resources, solar power and nuclear power could basically solve human society's future energy problems. Accordingly, while developing nuclear fission energy production, a vigorous search for new approaches and a policy of energy resource diversification will not only produce near-term benefits but also will be in accord with long-term objectives.

/The countryside must not be forgotten in energy development./ The rural energy shortage is much greater than the urban shortage, and consists primarily in a shortage of firewood and grasses. Currently more than a billion persons worldwide use firewood and grass as their fuel, with Chinese peasants accounting for half of these. How much fuel do this country's peasants require every year? If we figure an average of 20 jin of firewood per household per year, more than 600 million tons will be required. But currently the total output of crop stalks produced by all of the country's agriculture, as well as dried manure, firewood, methane and the coal supplied to the peasants by the state, fall far short of the nation's rural needs. Because of the shortage of fire fuel, the trees have been cut down in many areas and grasses have been uprooted, resulting in increasingly grave soil erosion. Currently soil erosion is a grave problem not only in the lower Yellow River valley, but in the Yangtze Valley as well. It has been estimated that if we do not pay attention to the desertification resulting from this ever-spreading soil erosion, in a few hundred years great cities like Peking will be surrounded by desert.

Because of historical traditions, this country's peasants will burn up more than 300 million tons of crop stalks every year. Stalks are not only a biological energy source but a precious raw material for light industry, a livestock feed and an organic fertilizer. Simply burning the stalks uses only 10 percent of the heat energy, while the other 90 percent is wasted. Buring of crop stalks year after year interferes with their return to the soil, so that soil fertility declines everywhere and the ecological balance is disrupted.

During the process of modernization, if we do not radically change the agricultural energy state of affairs in this country, starting by solving the fuel problems of our 800 million peasants, but rather continue to make do by burning crop stalks, we will not be able to claim that our energy problem has been solved or say that we have achieved modernization. At present the agricultural energy problem is already attracting serious attention in many countries. Two extreme positions have already been advocated in the United States. One is that of continuing current American agricultural management techniques, and at the same vigorously developing new energy sources so as to gain a new lease on life before the petroleum is exhausted. The other, which some call "ecological equilibrium theory," stresses abandoning the existing type of management, and returning to the cultivation techniques of the early twentieth century based on human and animal muscle power. We believe that we should proceed on the basis of this country's actual situation, and systematically improve the current agricultural energy situation, by first meeting the peasants' requirements for household fuel, then implementing modernization of agricultural energy sources. It must be recognized that our country has extensive rural areas with a large population, and it will be hard for the state to supply all rural energy sources over a long period; instead, we should rely on development of many

types of local energy sources. Depending on local conditions, development of methane production, construction of small-scale hydroelectric installations, the opening of small coal pits, the planting of firewood and charcoal woodlots, and the utilization of solar and wind power as soon as possible, are some good, fast methods of solving the country's agricultural energy resource problem. Chief among them are extensive utilization of methane and the construction of small hydroelectric stations.

The Path to Solving This Country's Near-Term Energy Shortage Problem

In the 1980's our country will face a grave energy shortage. It is estimated that before 1985 the rate of growth of our energy resources cannot exceed 20-30 percent. The rate of growth in the second half of the 1980's will not be much greater. In this period, the needs of production and daily life will be in clear contradiction with the low rate of growth of energy sources. There are three ways of resolving this contradiction: first, constructing new energy bases; second, conserving energy; third, having a rate of economic development commensurate with our energy resources. In the near term, active development of new energy sources, including the construction of new energy bases, and development of solar power, wind power and tidal power as well as rural methane gas will be helpful in increasing our country's energy supply and solving the energy shortage. However, because the energy construction cycle is relatively long, with such facilities as fossil-fuel power plants (including coal-fired plants) hydroelectric stations and nuclear power stations taking about 10 years, embarking on this path will not have a marked effect on solving the energy shortage.

The other two available approaches are energy conservation and adjusting the rate of development of the national economy. Since the state was founded, the rate of growth of the national economy has averaged 8 percent, while the rate of growth of energy consumption has been much faster. Naturally there are exceptions in which a rapid rate of growth of the national economy has been reached without increased energy consumption, such as last year in this country. But we should point out that to continue the rapid advance of the national economy we must have a relatively large rate of growth of energy supply as a guarantee. In the near term, it would seem that rational adjustment of the rate of growth of the country's economy so that it is in accord with energy consumption is an effective way of solving our country's grave energy shortage and arranging the national economy and the people's livelihood.

To reform our country's existing economic structure is an undertaking of great significance. We must develop fewer energy intensive heavy industries, develop more low energy consumption, rapid-accumulation light industries, improve production quality, reduce material overstocks and waste, use high-performance, high-capacity, high-efficiency equipment, resolutely implement the approach of "closing, cessation, combination, conversion" of enterprises with high energy consumption and poor quality which are difficult to convert, and no longer allow the "coal tigers, oil tigers and electricity tigers" to continue swallowing up our country's energy resources. In this way we can use less energy and maintain a relatively high rate of development of the national economy.

In the 1980's we will have to concentrate our attention on energy conservation. Energy conservation is a strategic measure to solve the problem of our country's energy shortage and promote its modernization. Energy conservation and development are two inseparable aspects of the solution of the energy problems of our country's

modernization construction, like the two wheels of a cart or the two wings of a bird. The quest for higher output through conservation is an important way of solving the current energy shortage.

It is necessary to have a correct understanding of energy conservation. Energy conservation is a decrease of waste at every stage of energy consumption, and improvement of the efficiency of energy use. Energy conservation does not at all mean a drop in output or in the standard of living. Rather, the same quantity of energy resources should be used to obtain increased output and the highest standard of living.

8480

CSO: 4006

ENERGY

BRIEFS

POWER GENERATION UP SHARPLY--Good news from the power industry: From January to August of this year, power generation throughout the nation was up 9.3% over the same period last year, fulfilling 68.2% of the yearly plan. During the first two-thirds of September, the average daily increase was 30 million kwh over the same period last year, which alleviated the power shortage in many areas and created conditions conducive to significant advances in industrial and agricultural production. In order to generate more electricity, they sought higher production through conservation. Strengthening management of fuel, they were able to reduce the amount of standard coal needed to generate 1 kwh of electricity by 9 grams over the same period last year, realizing a total savings in coal of 2.10 million tons. With advances in switching oil burning units to coal burners, 280,000 fewer tons of oil were burned this year. Power generating plants also paid attention to conserving energy themselves, saving a total of 223 million kwh of electricity in comparison with last year. [Beijing GONGREN RIBAO in Chinese 26 Sep 80 p 1]

CSO: 4006

MINERAL RESOURCES

WATER INJECTION APPLIED IN DAQING OILFIELD

Beijing SHIYOU XUEBAO [ACTA PETROLEI SINICA] in Chinese No 1, Jan 80 pp 63-76

[Article by Tang Zengxion [0781 2582 3574] of Daqing Oilfield: "Exploitation of Daqing Oilfield with Water Injection Method"]

[Text] In September 1959, the Song [liao Basin] Key Well No 3 was the first to strike the oil layer, thus starting the flow of industrial oil. Subsequently, no time was lost in investigating the extent and reserves of the oilfield, while the first exploitation region swung into production in June 1960. By 1976, the annual oil output of the entire oilfield had reached the highest projected level, and there were 3 years of stable production from 1976 to 1978. In the course of exploitation, relatively careful investigations of Daqing oilfield's geological conditions were carried out. Based on the different geological features of various regions, both the line cutting water injection pattern and areal sweep flood pattern of exploitation well networks with varying well spacings were employed. Aimed at the specific conditions of the oilfield, efforts were made to study and use the exploitation principle of "early period separate layer injection to maintain the reservoir pressure at nearly the same initial level," as well as the entire line of oil recovery technologies and techniques, which has brought about excellent results in the exploitation of the oilfield. The oil reservoir pressure was continuously maintained at nearly the same initial pressure level. At present, the average reservoir pressure of several thousand recovery wells throughout the entire oilfield is slightly higher than the initial level. Thus, the oil wells are still fairly good gushers. Besides the oil-water transitional belt where the shallow oil layer and high viscosity crude oil make it necessary to use oil pumps, 90 percent of the total number of wells are gushers, and none of them have ever stopped gushing or dried up which are usually caused by reservoir pressure drop. In the earliest exploitation regions where over 25 percent of the geological reserves have been recovered and the combined water contents account for nearly 60 percent, the recovery rate is maintained at over 2 percent, and the daily production per well is still at the same level as during the early stage of exploitation. Since 1965, through periodical general surveys of oil-water wells with the separate layer testing technique, in coordination with reservoir heterogeneity research and fluid dynamics calculations, the plane distribution of floodwater and remnant oil in all the oil layers became relatively clear, which helped to strengthen the aim of various enhanced recovery measures, thus producing remarkable results. In sum, as both the exploitation plans and technological measures conform to the specific conditions of the oilfield, the high yield period of the oilfield has been prolonged, and the final recovery rate of the oilfield has increased.

1. Geological Conditions of the Oilfield

The Daqing Oilfield is situated in the central portion of the Songliao Basin which is a large Mesozoic/Cenozoic inland sedimentary basin, covering approximately 360,000 square kilometers. Jurassic, Cretaceous and Tertiary strata are widely distributed inside the basin, totalling over 6,000 meters in depth. Most of the surface is covered by Quaternary sediments. Daqing Oilfield's source beds, reservoirs and overlying strata are Qingshankou Group, Yaojia Group and Nenjiang Group strata of the Lower Cretaceous Series, and there is a very thick source rock which had developed in the central portion of the basin. Extending from north to south is a river-delta facies sandstone system wedged right into the source bed. The Daqing Oilfield is situated in a favorable spot where superimposed development of sandstone and excellent source beds had occurred (Figure 1).

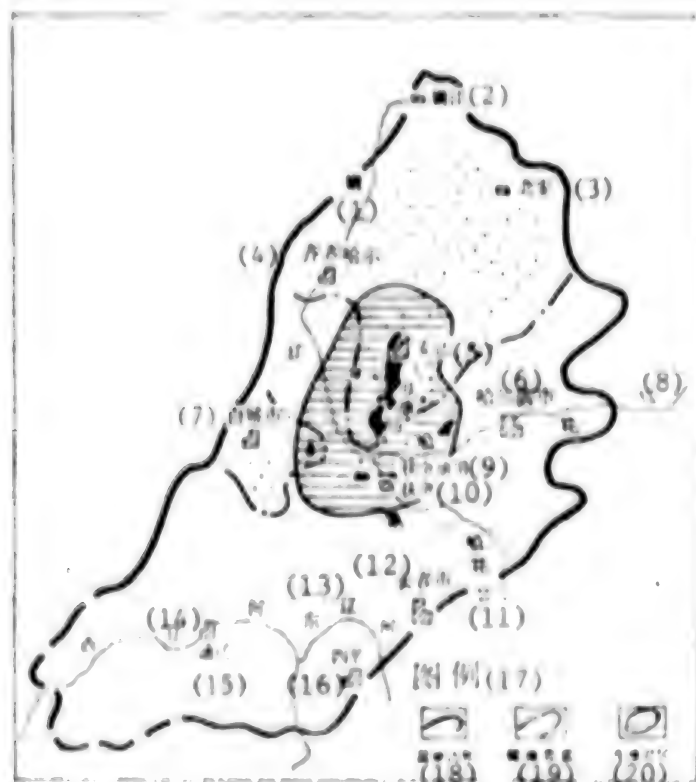


图 1 松辽盆地白垩系主要油层与储油岩分布图

Figure 1 Distribution map of the main source beds and reservoir rocks of the Lower Cretaceous Series in the Songliao Basin.

- | | |
|---------------------------|----------------------------------|
| (1) Nen Jiang (river) | (11) Di'er Songhua Jiang (river) |
| (2) Nenjiang | (12) Changchun City |
| (3) Bei'an | (13) Dongliao He (river) |
| (4) Qiqihar | (14) Xiliao He (river) |
| (5) Anda | (15) Tongliao |
| (6) Harbin | (16) Siping |
| (7) Baicheng | (17) Map Legend |
| (8) Songhua Jiang (river) | (18) basin border |
| (9) Fuyu Oilfield | (19) reservoir rock area |
| (10) Fuyu | (20) source bed area |

Daqing Oilfield is located at a grade 2 structural zone known as the elongated dome of the central depression area in the Songliao Basin which is a long axis antiformal structure; the axis runs 20 degrees north by east. The structure slopes gently, and the dips at both wings are unequal: the east wing dip measures 1-4 degrees, and the west wing dip is 4-14 degrees. There are seven local high points located at Lamadian, Sa'ertu, Xingshugang, Guotaizi, Taipingdun, Putaohua and Aobaota. The oil reservoir is 700-1,200 meters below the surface; the oil-water interface is lower in depth than the structural saddle between the local high points. The structural formation was accompanied by many normal faults, almost 500 in all. The overwhelming majority of the faults run in the direction of NW and NNW. The fault throws generally fall within 30-80 meters, the maximum being 190-odd meters. The faults extend 1-3 kilometers and the oil-water distribution is not affected by the faults.

The oil-bearing rock system of Daqing Oilfield is composed of interbedding layers of sand and mudstones of a river-delta facies system. As the sediments originated from the north, there is sandstone growth in the northern portion of the oilfield. Moreover, each well can hit some 30-40 layers of oil reservoir; for oil reservoirs measuring over 4 meters thick, each well can penetrate more than 4-6 layers. The thickest layer can reach over 40 meters, and mainly contains medium grain sandstone. Most of the sandstone in the southern portion of the oilfield have become mudstone through facies change; each well can only strike 5-6 or even less layers of oil, each measuring 0.5-2 meters thick on the average, and composed mainly of siltstone. The thickness of oil-bearing section is controlled by such factors as sandstone growth distribution and structural position. Some oil-bearing layers can reach over 500 meters thick, and the average thickness is 200-300 meters. In the southern portion, the oil-bearing layers are only approximately 50 meters thick. From north to south, the average reservoir thickness decreases from 55 meters to 2-3 meters.

The oil reservoirs are relatively weak deuterogenic rock debris feldspathic sandstone. While the rock structure is still basically controlled by primary sedimentary structure, the cement is mainly argillaceous, and the cementation is classified as contact type or porous-contact type. The stratification structure of the internal layers of the reservoirs are very well developed, and the common types of stratification are linear diagonal bedding, arc diagonal bedding, fine diagonal bedding, and various kinds of cross stratifications. The porosity is 20-30 percent, and core analysis show that the air permeability ranges from 1 millidarcy to ten-odd darcies. From the oil testing of single layers in the oilfield, it is found that the mean permeability of oil producing layers ranges from 30 to 1,200 millidarcies. The permeability between the various layers is exceedingly great, while high, medium and low permeable cross beddings are distributed upwards. The permeability changes primarily with granularity and argillaceous contents; the sandstone grains become increasingly finer from north to south, while permeability drops remarkably. The oil-water relative permeability curve under flowing oil-water facies conditions is obtained through testing of natural cores.

The average oil saturation is 60-80 percent, which is pretty much related to the permeability (Figure 2).

[Figure 2 on following page]

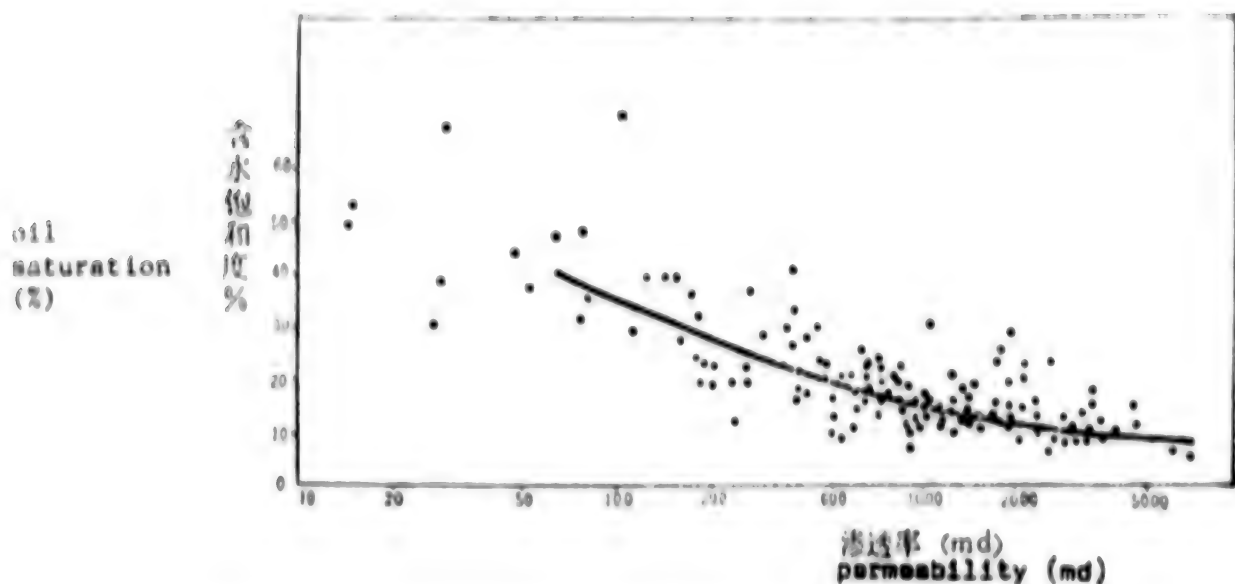


Figure 2 Oil saturation - permeability relation curve

图 2 含水饱和度与渗透率关系曲线

The rock surface has weak oleophilic property, but can be changed into weak hydrophilic through long period of waterflooding and washing.

The crude oil in Daqing Oilfield's is described as paraffin-base petroleum because its paraffin content is as high as 20-30 percent. Its solidification point is high; the solidification point of degassed crude oil is 25-30 degrees Centigrade. On the average, the sulphur content is less than 1/1000. The crude oil in the northern portion of the oil field has a relatively high content of colloid, thus the crude oil's viscosity and specific gravity gradually increase from south to north. The primary oil-gas ratio is 45 cubic meters per ton; the volume coefficient is 1.12; from north to south, the saturation gradually drops from 110 atmospheric pressure to 64 atmospheric pressure. Table 1 shows the changes in crude oil properties from south to north:

表 1 大庆油田原油性质变化表

1. 油 田	2. 饱和压力 (大气压)	3. 原始油气比 (米 ³ /吨)	4. 体积系数	5. 粘 度 (厘泊)		6. 比 重 D_{4}^{20}	7. 含 胶 (%)
				(1) 地 层	(2) 地面(50℃)		
(1)喇 嘛 甸	104.9	48.5	1.122	9.6	21.6	0.8640	14.3
(2)萨 尔 图	91.0	47.2	1.122	9.4	20.4	0.8583	14.3
(3)杏 树 岗	75.8	44.4	1.116	8.6	14.1	0.8520	11.2
(4)太 平 屯	58.0	40.4	1.115	8.2	11.6	0.8485	9.9
(5)高 台 子	69.3	40.5	1.122	6.9	15.8	0.8533	8.1
(6)葡 萄 花	64.0	45.4	1.124	4.9	16.4	0.8393	6.3
(7)独 包 塔	76.5	44.4	1.123	6.1	16.3	0.8556	10.3

[Key on following page]

Table 1 Changes of crude oil properties in Daqing Oilfield

1. oilfield
 (1) Lamadian (2) Sa'ertu (3) Xingshugang (4) Taipengdun
 (5) Gaotai (6) Pulaohua (7) Aobaota
2. saturation pressure (atmospheric pressure)
3. primary oil-gas ratio (cubic meters per ton)
4. volume coefficient
5. viscosity (centipoise) (1) strata (2) surface (50 degrees Centigrade)
6. specific gravity
7. colloidal percentage

The reservoir pressure of Daqing Oilfield is slightly higher than the static water column pressure; thus, most of the oil wells are gushers. The three high points in the northern part of the oilfield have large areas, relatively integral structures, and comparatively extensive oil reservoirs. Thus, in various parts of the oilfield, all the oil reservoirs belong to a common pressure system. A linear relation exists between the pressure and reservoir depth, and there is a common oil-water interface. In the southern part, the reservoir permeability is poor, the extended area becomes small, and the oilfield is cut up by faults. Thus, each block forms its own pressure system and oil-water interface, while water bands and oil bands appear in some areas. In the northernmost part, the reservoir pressure at the high point in Lamadian is almost equal to the saturation pressure, and the undissolved natural gas has formed into a gas cap at the summit point.

The oilfield water is classified as heavy sodium carbonate; its gross salinity is 6,000-9,000 mg per liter, and its chloride ion content is 2,000-3,000 mg per liter, varying from low in the north to high in the south. In the northern part of the oilfield, the top layer portion of the oil-water interface is characterized by oxidized crude oil, increased contents of colloid and bitumen, plus the formation of thick oil section measuring approximately 50 meters high, and the crude viscosity is twice or several times greater than normal viscosity. The presence of the thick oil section affects the oil drive force of the edge water during the exploitation work. In the southern portion, although there are no evident thick oil sections on the oil-water interface, the lithologic character of the reservoirs becomes finer, the permeability becomes poorer, the extended areas of sandstone become smaller, and the driving force of border water is not strong.

II. Maintaining Reservoir Pressure Through Separate Layer Water Injection Technique in the Early Period

Daqing Oilfield is a large oilfield characterized by lack of edge-water drive condition. In the northern part of the oilfield, both the initial formation saturation pressure difference and the elastic energy are small. Based on calculations and statistical information from the actual mining area, during the elastic recovery stage when the reservoir pressure drops to the saturation pressure level, it is possible to extract only approximately 1 percent of the geological reserves. When the reservoir pressure falls below the saturation pressure and the crude oil within the reservoirs begin to degas, oil and gas facies start to flow inside the reservoirs. The oil facies permeability inside the reservoirs and near the well walls rapidly fall while the oil-gas ratio of wells swiftly ascend; the well temperature

drops, and the wax precipitation point shifts downward, thus causing difficulty in oil well management and production slump as well. Moreover, following the degasification of crude oil, the crude viscosity multiplies and increases the flow resistance of the crude oil inside the reservoir, thus causing both the well output and oilfield recovery rate to decline. It is predicted that with the dissolved gas drive recovery method, Daqing's dry-up recovery rate can only reach 15 percent. Thus, the use of natural energy in the exploitation of Daqing Oilfield can only lead to unstable well recovery and very short period of high yield in the oilfield. Moreover, the recovery mode becomes even more complicated, making it difficult to manage the oilfields, not to mention the extremely low recovery rate during the primary recovery stage. On the other hand, when the subterranean crude oil viscosity is doubled and redoubled, and water injection is used for secondary recovery, it is by far impossible to restore the well recovery to the same level which it had attained during the early period of exploitation, as the water drive recovery rate will drop drastically, thus producing bad results in exploitation. Therefore, it is imperative to resort to early period artificial waterflooding in the exploitation of Daqing Oilfield, i.e. a recovery mode which can maintain the reservoir pressure, and thus produce excellent results in prolonging the high yield period and enhancing the recovery rate.

Since the 1950's, oilfield exploitation workers have attached much importance to the maintenance of reservoir pressure. But they still hold different views on the limits of pressure maintenance. Various bounds were proposed when plans for exploiting the Daqing Oilfield were under study. Based on the discussion by Krilev and other Soviet scientists who suggested that the application of the gas-oil miscible-type water flooding method was conducive to the enhancement of recovery rate, some people proposed to reduce the reservoir pressure to 5-10 atmospheric pressure below the saturation pressure level before the waterflooding stage; they believed that recovery under such low pressure conditions could lead to relatively high ultimate recovery rate. In 1973, the Fluid Mechanics Laboratory of the Scientific Research and Designing Academy of Daqing Oilfield conducted similar experiments with analog tubular physical models of Daqing Oilfield's reservoirs and crude oil; the tests gave saturation pressures below 15 percent, and when the saturation point of the gas content inside the oil layers reached 5 percent, the water drive recovery rate hit the peak level. This meant that the recovery rate could increase 3-5 percent as compared against water injections above the saturation pressure level only when the reservoirs contained bound gas no gas flows at all. Once the saturation point of the gas content exceeded 15 percent and evident gas flows appeared inside the reservoirs, the recovery rate dropped drastically (Figure 3).

Figure 3 Curves showing relation between recovery rate and initial gas saturation point in heterogeneous model experiment.

1. dissolved gas drive recovery rate
2. water-free recovery rate
3. recovery rate under one pore volume water flooding conditions
4. recovery rate under two pore volume water flooding conditions
5. recovery rate (%)
6. initial gas saturation point (%)



图3 非均质模型实验中采收率与原始含气饱和度关系曲线

1—溶解气驱采收率, 2—无水驱采收率, 3—1倍孔隙体积水驱采收率, 4—2倍孔隙体积水驱采收率, 5—采收率, 6—原始含气饱和度

Based on analysis of foreign and domestic test data, it can be seen that in such a large oilfield as Daqing which has multiple oil layers and heterogeneous growth, it is practically impossible to cause the reservoir pressure to evenly reduce to a certain level during the initial stage of water flooding. Once the water injection begins, the inter-well and inter-layer pressures become increasingly uneven, which makes it even harder to maintain the reservoir pressure at an even level. Even if the application of the gas-oil miscible-type water flooding method can cause some increases to occur in the water drive recovery rate, it still amounts to practically nothing at all. Thus, when exploiting Daqing Oilfield, it is necessary to maintain the reservoir pressure above the saturation pressure. As the initial formation saturation pressure difference in Daqing Oilfield's chief exploitation region was only approximately 10 atmospheric pressure, the reservoir pressure was maintained at a level no lower than 5 atmospheric pressure below the initial reservoir pressure.

Although it was possible to slightly reduce the reservoir pressure before water flooding in the southern parts of the oilfield where the initial formation saturation pressure difference was great, owing to the upward drift of the degassing point following the reduction in saturation pressure, the gushing capacity of wells began to decline. With no water content, the gushing stopped when the oil reservoir pressure fell 20-30 atmospheric pressures. During the elastic recovery stage, only 1-2 percent of the geological reserves could be recovered. Moreover, with the occurrence of breakthroughs, the lowest gushing pressure rose even higher. Thus, the reservoir pressure was kept within the same bounds as in the northern parts of the oilfield. Based on the exploitation principle of reservoir pressure maintenance in the early period of water flooding, Daqing Oilfield formulated its first plans for a pilot exploitation region. In June 1960, the central pilot region of Daqing Oilfield swung into production. In October that year, the same region started to inject water. Subsequently all the exploitation regions began to apply the principle of starting water flooding and oil recovery engineering work simultaneously in the exploitation and construction projects. Early period water flooding was then adopted throughout the entire oilfield, i.e. injecting water right at the outset of oil recovery operations. Since the water injection method and well patterns were well adapted to the specific conditions of the reservoirs in all the exploitation regions, excellent results were attained both in water flooding and actual oil well production. From the very outset of production, all the exploitation regions managed to maintain their reservoir pressures. No one has experienced any sharp pressure drops since the beginning of well production, or has ever had to gradually recover the pressure through water injection. No one has had to shift the well patterns or change the cut spacings owing to inadequate results since water injection began. In exploitation regions with two or three series, careful study was conducted on the stability of the layers between the series, and partial adjustments were made to prevent stray currents from occurring between the series. In this respect, there is no doubt that we have excelled Soviet contemporary work in the water flooding exploitation of the Tuimazy, Romanshkino and Arlan Oilfields.

Thanks to the principle of maintaining reservoir pressure through early period water flooding, we have attained the projected results in exploitation work. In the course of water flooding and recovery, the reservoir pressure remained steady, the wells kept on flowing vigorously under high producing potential. Moreover, the oil recovery index slightly increased, and oil production in the exploitation

regions also rose modestly, while the properties of stratigraphic crude oil remain unchanged. But the occurrence of breakthroughs gave rise to new problems, i.e. injection water breaking into individual high permeability layers.

Daqing Oilfield is a multi-pay field with interbeddings of sandstone and mudstone. Within the same well, the difference between the highest and lowest permeability among the various layers could reach as much as 20-40 times on the average. Moreover, the highest permeability could be 2-3 times higher than the average permeability of various layers in the well. The flood water mainly enters a small number of high permeability layers, thus causing premature breakthroughs. The water contents in high pressure water-bearing layers not only rapidly increase, but also interfere with the oil yield of other layers, thus causing the water contents in wells to rise even more rapidly. As a result, production falls drastically. In 1964, according to predictions based on actual data from the central region during the earliest period of exploitation, with the sweep-out water flooding mode, it was possible to maintain high yield production for only 3-5 years; and as each 1 percent of the geological reserves was recovered, the combined water contents would go up 7-8 percent while the ultimate recovery rate of the oilfield could only reach as little as approximately 25 percent.

To enable more reservoirs to be exploited with the water drive method, and in order to further improve the exploitation results and prolong the high-yield period, in 1964, the research institute successfully developed the single-string separate layer technology, which included the use of hydraulic pressure difference type sealers and water distributors, thus restricting the infiltration of flood water into high permeability layers, and increased the amount of flood water in medium and low permeability layers. By the end of 1965, all the injection wells requiring separate-layer water distributors throughout the oilfield had adopted the preceding technology, thus realizing separate-layer water flooding; each well was divided into 3-5 zones, and the separate-layer injection wells accounted for 87 percent of the total number of injection wells. Beginning in 1965, the early period separate-layer water flooding technique was applied in new exploitation areas, i.e. while the oil wells swung into production mode, flooding tests and multi-layer tests were conducted in injection wells, which subsequently began to inject water into separate layers. Over the past 10-odd years, the number of multi-zonal injection wells has been maintained at approximately 80 percent of the total number of water injection wells. In 1973, they successfully developed mobile eccentric water distributors and multi-layer probe meters. Without having had to pull out the well strings, this type of eccentric water distributor can adjust water distribution on any layer section, and the separate-layer testing instrument is fairly accurate and easy to use. With this type of multi-layer water flooding technology, there is no limitation on the number of layer sections in multi-zonal water distribution. In practical usage, due to the increasing complexity of water distribution and testing with the increase of layers, this type of technology is generally used for 4-5 sections, or at most 8 sections. Beginning in 1976, the separate layer water flooding technology was combined with the use of anticorrosive oil pipes, and became quite popular in Daqing Oilfield. It not only helped to increase the accuracy of water distribution, but also enabled even better control over the volume of flood water throughout the various layers.

With the development of separate layer water injection technology, new understanding and new developments have been attained in the principle and method of separate layer water distribution. In the early stage of this type of technology, it was required to propel the water lines uniformly into the high, medium and low permeability oil layers. Through a period of practical work, it was proven infeasible. This was due to the fact that most of the low permeability layers did not have sufficient water absorption capacity to take in the specified amount of flood water. Due to the heterogeneity at the distribution of permeability on the surfaces of the oil reservoirs, the water lines still could not be uniformly propelled even if it were possible to attain equal water flooding intensity or inject the same volume of water into each meter of reservoir depth. The emphasis on uniform water lines and over-limitation on the volume of water injected into the high permeability layers caused the reservoir pressure and production capacity to slowly fall. Thus, the principle of separate layer water distribution should be: Allow more oil reservoirs to be exploited with adequate water flooding. In oil reservoirs with relatively high water absorption capacity, try to maintain the reservoir pressure at a level near the initial value by means of the separate layer water injection technique, but do not allow the reservoir pressure of individual oil layers to become so high as to prevent other layers from producing oil. Redoubled water flooding measures such as extra injections should be adopted in poor absorption capacity reservoirs so as to store up more energy and pave the way for late period exploitation. The principle of injecting water into separate layers in the early period and maintaining the pressure during recovery work has enabled all the exploitation regions in Daqing Oilfield to attain adequate results from water injection. The reservoirs which respond well to water flooding and have excellent production capacity account for approximately 60 percent of the total reserves. The separate layer water flooding technique has helped to prolong the high-yield/stable-yield period, control the ascending rate of water content, improved the utilization factor of oil wells, and improved the exploitation results of the oilfield.

When breakthroughs occur in water flooding recovery, it is imperative to promptly solve such technical problems as crude oil dehydrating, treatment of oil-contaminated water and the reinjection of used water. Daqing Oilfield uses the electrochemical denaturation method which can reduce the water content of crude oil to below 0.3 percent. The purification treatment of oil-contaminated water further reduces the oil content to below 30 mg per liter, thus meeting the requirements on the quality of water to be used in water flooding. The reinjection of used water not only solves the problem of continuously increasing demands for more injection water, but also helps to maintain the oil reservoir temperature. Daqing Oilfield's reservoir temperature is approximately 45 degrees Centigrade. Due to the high paraffin content in crude oil, the wax precipitation temperature of the crude oil is also high (generally about 36 degrees Centigrade; it reaches 39-42 degrees Centigrade at Jiaodan, the high point located in the northernmost part of the oilfield). Thus, the maintenance of reservoir temperature and the prevention of wax precipitation constitute another problem in the water flood exploitation of Daqing Oilfield. The chief reason behind the reservoir temperature drop during the middle period of oilfield exploitation lies in the oilfield's relatively high water content, plus the large increase in injection water and recovered liquids. But the reinjected water percentage also increases with the rising water content. Thus, the reinjection of used water is a fairly good way of maintaining the reservoir temperature. In addition, good solutions have been found for such problems as iron removal, dirt prevention and germ extermination, which occur during water injection and used-water reinjection.

In 1977 and 1978, to increase the injection volumes of high and low permeability layers, the injection pumps were changed and improved, which generally increased the well head pressure of injection wells from 100-110 atmospheric pressure to over 130 atmospheric pressure, causing the flood water volume in the low permeability layers to greatly increase. At present, the well bottom pressure of injection wells is already close to the fracture pressure of reservoirs.

III. Research on the Heterogeneity of Oil Reservoirs

Ever since the preparation stage for prospecting and exploiting Daqing Oilfield began, much importance has been attached to research on the heterogeneity of the reservoirs. Having explored the oil-water border of Daqing Oilfield and controlled the oilfield's area and reserves, 519 geological data wells were drilled throughout the entire field at the density of one well per 3-4 square kilometers. All the wells have undergone coring tests in the reservoir section, and a total of over 53,500 meters of cores have been extracted. The core recovery has reached over 90 percent, including four oil-base mud cored wells. In order to probe deeper into the heterogeneous conditions near the oil layers, in 1965, five cored wells were drilled 100-120 meters apart in the northern area. In 1973, to study the heterogeneous conditions and watered-out features inside thick reservoirs, thick layer pilot areas were developed; with well spacings of 200 meters in square patterns, 13 test wells were drilled; nine of them were cored wells, from which 480 meters of cores were extracted. Careful lab analysis of the cores were made, including porosity, permeability, oil saturation, chlorate and carbonate contents, granularity, ore slice verification, clay minerals, pore radius distribution, oleophilic and hydrophilic properties of rock surfaces, capillary pressure, and determination of facies permeability curves. Special attention was attached to reservoir permeability, and 10 samplings per meter were extracted from the reservoir portion intensive testing. Cored wells were also drilled in selective reservoirs with different permeability grades and heterogeneous features; single layer oil tests were conducted in 1,345 layers, while production data and pressure restoration curves were used to determine the effective permeability. Such a wealth of data provides an excellent basis for reservoir heterogeneity research. By correlating the relative resistivity of rocks with oil saturation point, and oil-saturation point with permeability, it was possible to combine the core analysis and single-layer oil test permeability data with the electric logs of the preceding wells, and thus plot permeability graphs which interpret the electric logs of various oil layers in each region (Figure 4). The mean error is 30-40 percent, but the graphs are quite accurate for oil layers with differences between high and low permeabilities amounting to several tens of times; the graphs help to interpret the permeabilities of each oil layer in every well of Daqing Oilfield.

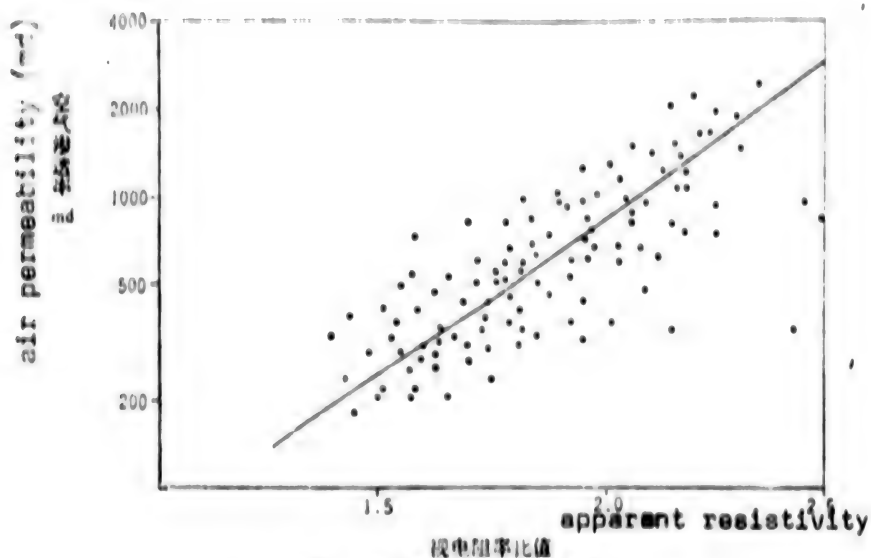


图 4 电渗解释渗透率图版

Figure 4 Permeability interpretation chart using electro-osmose logging method

Large scale coring observation and research work also facilitate in-depth comparative study of the oil layers. On the basis of comparative study through the use of auxiliary criteria which consists of regionalized key beds and local growth, and based on the cyclic sedimentation of fragments, the entire oil-producing zone of a well is divided into 40-odd small scale depositional cycles known as sandstone groups. Each depositional cycle forms a stratum of 10-15 meters thick, and the depositional cycles can be traced back to the entire oilfield. Within a depositional cycle, the sand layers have relatively fixed positions. Reservoir comparison is carried out by comparing the cycles; under recovery well pattern conditions, it is possible to compare sandstones measuring more than 2 meters thick with no errors at all; and thin sandstone comparison is also relatively reliable. Profile charts and plane charts of reservoirs are plotted against the results of multi-bed reservoir comparison, plus the division of reservoirs into effective layers and the interpretation of permeability. Based on classification according to reservoir depth, properties and planar distribution, Daqing Oilfield's oil layers can be divided into the following general categories:

1. Large-scale thick reservoirs with high permeability distribution -- This type of reservoir only has 1-3 sandstone groups in each region, and constitutes the chief target of exploitation in the oilfield.
2. Thick reservoirs with medium/high permeability distributed in strip areas -- This type of reservoir has 8-10 sandstone groups in the northernmost part of the oilfield, and gradually diminishes southwards. Thin lenticular sandstones often appear in the sandstone groups' corresponding undeveloped layers.
3. Widely distributed thin low permeability layers -- This type of reservoir includes some layers which are chiefly composed of fine siltstone and pelitic siltstone; the effective thickness portion of such layers are characterized by lenticular distribution. It is the most well-developed type of reservoir in the oilfield.
4. Scattered thin lenticular sandstone layers -- This type of reservoir is found in the central and southern portions of the oilfield.

Although the depths, areas and permeabilities of the preceding types of oil-bearing sandstones differ greatly, the bases are all surrounded and isolated by impermeable mudstones, thus forming independent bodies of oil-bearing sandstone, which are the basic units of oil-water motion in the course of water injection exploitation. Oil-sand maps are charts which reflect the depths, permeabilities and planar distributions of the basic units of oil-water motion (Figure 5).



Figure 5 Oil-sand map of Putachua's I₂ reservoir located in the western part of the central region.

Legend: (1) oil well; (2) water injection well; (3) observation well; (4) abandoned well; (5) reservoir depth; (6) permeability contour

From the numerous facts pertaining to more than 10 years of oilfield water injection exploitation work, it can be seen that in the overwhelming majority of cases, oil-sand charts agree with the results of multi-layer testing in the following aspects: oilfield heterogeneous conditions, predictions on the water absorption capacity of various layers during water flooding, the multi-bed yield of oil wells, oil well breakthrough time, and determination of breakthrough positions in oil wells, etc. This means that oil-sand maps can basically reflect the objective conditions of heterogeneous reservoirs. But in some well groups and reservoirs, the actual oil-water motion and distribution do not agree with the permeability distribution in the sandstone charts. Moreover, under similar reservoir permeability conditions in different regions and layers, the characteristics of oil-water motion differ greatly, which goes to show that electric logging interpretation of permeability cannot fully reflect the objective conditions of permeability heterogeneity.

Studies on the permeability stratification of various kinds of reservoirs and water drive reservoir experiments with actual core reservoir physical models have revealed the following three chief reasons behind the failure of electric log interpretation of reservoir permeability to reflect the objective conditions of reservoir heterogeneity.

1. As the electric log interpretation of reservoir permeability is reservoir mean permeability, it can not reflect the permeability heterogeneous conditions within reservoirs. The difference between the highest permeabilities of two reservoirs with equal mean permeabilities can range as much as two or three times; the chief factor controlling the motion and distribution of oil and water lies in the highest permeability as flood water breaks through the highest permeability section first.
2. The permeability distribution of and inter-relationship among the wells on the oil-sand map are represented by permeability contours based on electric log interpretation which do not reflect the depositional characteristics of the sand bodies in the course of their formation. The current sand bodies were not produced from only one formation process, but many formations. Rock layers of different formation periods are often separated from each other by interbeddings of low permeability or even thin argillaceous strata. Thus, within a sand body, layers of the same formation period have relatively good planar permeability. The highest permeability portions of the same formation period are especially susceptible to breakthroughs by flood water.
3. The log interpretation of permeability can not reflect the stratified structure of oil reservoirs. According to tests on the horizontal permeability and vertical permeability of relatively well-developed reservoirs, as well as experiments with physical models of water-drive reservoir planes, it has been determined that relatively great differences exist between the permeabilities of parallel stratifications and perpendicular stratifications. Moreover, the situation also varies in water injection advance.

In the study of the characteristics of microdeposition, lab tests were conducted with planar physical models of water drive reservoirs which revealed that flood water first advances along the stratifications. It is easier to propel injected water into linear diagonal stratifications, but the water drive reservoir efficiency is the lowest. It is not easy to propel flood water into cross-beddings, but the

water drive reservoir efficiency is the highest. When water is injected into parallel stratification planes within the same diagonal stratifications, the waterline frontal difference becomes prominent, and the drive efficiency is low. But as water is injected into perpendicular stratification planes, the waterline front becomes even, and the drive efficiency is high. The reservoir stratification structure is closely related to the reservoir's own lithologic character, granularity and depositional facies.

Through research on depositional facies, a deeper understanding of reservoir heterogeneity has now been attained in the following three aspects:

1. Daqing Oilfield's main reservoir (widespread distribution of thick high permeability oil layers) can be divided into two major categories: river facies and delta facies. The main oil layers of the river facies type is characterized by great permeability differences, remarkably cyclotheric granularity, and the high permeability at the bottom is much higher than the mean permeability. The chief oil layers of the delta facies generally have relatively small permeability difference within each stratum. In river facies sandstones, different river systems of different periods are characterized by relatively great differences in sand carrying capacity and wash undercutting force; thus it is possible to further divide them into such subfacies as river beds, banks, natural embankments, breached fans, etc., which have various degrees of infraformational heterogeneity.
2. The river bed subfacies of the river facies, as well as the cores of river-mouth sand banks and foliated subfacies of the delta facies are all situated in the highest permeability portion of the oil reservoirs. The production capacity is high and the flood water can easily break in here. But its planar distribution is also characterized by relatively large gaps; the river bed subfacies are often distributed in strips, while the cores of river-mouth sand banks and foliated bodies are spread out like small discs or fans.
3. The granularity of the sandstone bodies follow a certain cyclotheric sedimentation pattern, on the basis of which a thick sandstone can be divided into two or more depositional time units. The thin (only 10-40 cm thick) argillaceous or low permeability intercalated beds between different time units can often be traced within the scope of a well group or several well groups. Within this small scope, the thick layers are often composed of two or more stacked reservoirs, which permit very little or no oil-water run-off currents at all during flood recovery operation. To a certain extent, such layers should be regarded as dual or triple layers.

Based on the findings in the study of the preceding sedimentary facies, fairly good results have been achieved in the interpretation of the gaps existing in interzonal and interlayer oil-water motions. The flood depth in river facies sandstones is relatively shallow, especially in the river bed subfacies portions; the flood water breaks in through the high permeability zone at the bottom; thus, the breakthroughs are fast and water-cuts rise rapidly; and the flood water intrudes in strip-like patterns along the planar surfaces. In the case of delta facies sandstones, the flood depth is relatively deep; the breakthroughs and water-cuts rise relatively slow; within small planar areas, the breakthrough time and water-cut conditions are quite uniform. In the overlying section of main delta sandstone bodies, channel deposits of distributaries which had formed after the suppression of lake basins

often occur; although channel deposits are inferior to the main bodies of delta sandstone as far as thickness and mean permeability are concerned, they are often more conducive to flood waterline advances than the main sandstone bodies.

To determine the flooding characteristics of heterogeneous reservoirs, beginning in 1965, Daqing Oilfield drilled 16 closed cored wells in succession, totalling 1,610 meters of core samples. As the wells bored into the reservoirs, the cores were closed with sealing fluids so as to prevent mud flushing and thus attain better information on the reservoir flooding conditions.

In the thick layers of sandstone of river bed facies, the water washing section is limited to the reservoir bottom, and the flood depth of the whole layer amounts to only 20-30 percent of the total thickness, while the rest of the layer is not affected by flood water. But oil tests throughout the entire layer indicate water contents of more than 90 percent in the washing section, the drive oil efficiency can reach as high as 60-80 percent, and the rock surface has changed from weak oleophilic to weak hydrophilic. Studies through scanning electron microscopes reveal that this is mainly caused by the flood water which seeps away clay from the surface of rock grains, thus enhancing the heterogeneous property inside the layer. In the delta facies sandstone, the flood depth is greater, reaching as much as 80 percent of the total reservoir depth (Figure 6).

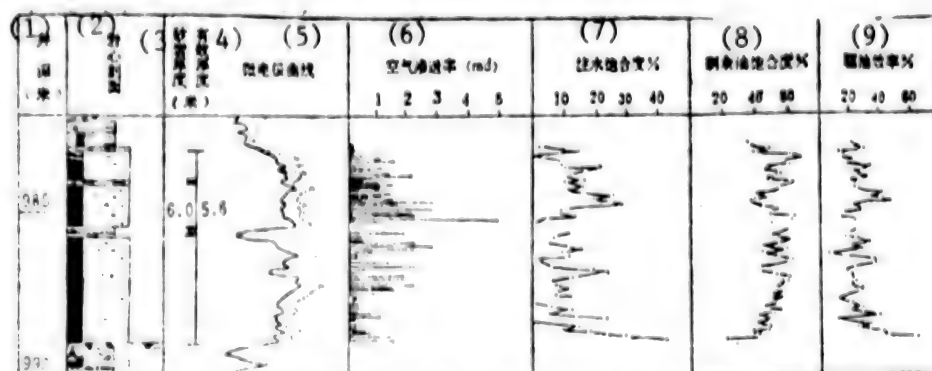


图 6 中检4-4井葡I₆油层层内水洗状况图

Figure 6 Chart showing water washing conditions inside Pu I₆ reservoir of central inspection well 4-4

- | | |
|-----------------------------|--------------------------------------|
| (1) well depth (m) | (7) flood water saturation point (%) |
| (2) core profile | (8) remnant oil saturation point (%) |
| (3) sandstone thickness (m) | (9) drive oil efficiency (%) |
| (4) effective thickness (m) | |
| (5) micro-electrode curves | |
| (6) air permeability (md) | |

Multi-section water flooding occurred in thick reservoirs with intercalations (Figure 7).

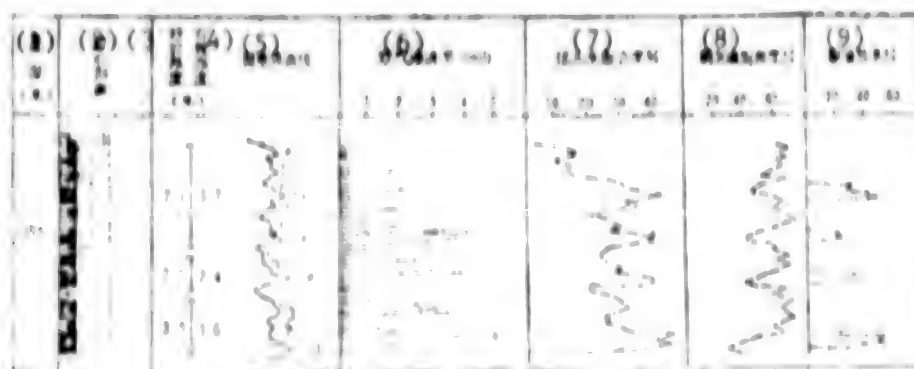


图 7 松辽盆地 III 类油层内部水洗状况图

Figure 7 Chart showing water washing conditions inside Pu I₁₋₃ reservoirs of inspection well 335.

- | | |
|-----------------------------|--------------------------------------|
| (1) well depth (m) | (7) flood water saturation point (%) |
| (2) core profile | (8) remnant oil saturation point (%) |
| (3) sandstone thickness (m) | (9) drive oil efficiency (%) |
| (4) effective thickness (m) | |
| (5) micro-electrode curves | |
| (6) air permeability (md) | |

At present, there is need to get a deeper understanding of the heterogeneity of Daqing Oilfield's reservoirs through research on the stratification and anisotropic properties of the reservoirs.

IV. Overall Adjustments of Oilfield and Tapping Potentialities

On the basis of reservoir heterogeneity research and pressure maintenance during separate-layer water flooding operations, separate-layer oil recovery techniques were developed in the course of the exploitation of Daqing Oilfield, thus ensuring high yields and stable yields. The technology includes the following main aspects:

(1) Selective Fracturing Technique

Packers are used to isolate specific zones for fracturing, and aqueous-base fracturing fluids are used for sand-carrying fracturing jobs, thus enabling the packers to be released stage by stage; each string can provide for the fracturing of 2-3 layers, but care must be exercised in choosing the suitable intervals for fracturing, i.e. low-permeability, low-yield reservoir zones which are conducive to optimum water flooding results, and generally do not suppress breakthrough layers. For reservoirs with poor flooding results, the first thing to do is to intensify water injection, or adopt such measures as selective acidizing or fracturing in injection wells, and start well fracturing when the preceding measures produce the desired results in the wells. This way, fairly good results can be attained in increasing production; on the average, approximately 15 tons of crude oil is produced daily

from each well with two fractured layers. Moreover, based on test data taken from separate layers following the fracturing operations, by regulating the flood volume in the various layers of the injection wells, it is possible to strike a balance between water flooding and oil recovery on the basis of increasing oil well production. After increasing production through the oil well fracturing method, it is possible to maintain a fairly long period of stable yields, and the overwhelming majority of yield-increase periods amount to over a year. Reservoir heterogeneity research and subdivision tests have proved that due to the very shallow flood depths, plus the presence of pelitic or low permeability thin intercalations inside the layers, it is possible to employ the selective fracturing technique. Prior to the fracturing operations, small displacements of fracturing fluids carrying tiny wax balls of low oil-solubility are injected under low pressure into the oil layers. Owing to the high permeability of the flooded portions of the oil reservoirs, plus the high relative permeability to water, the low pressured water-base fracturing fluids basically enter the flooded portions only, and rise with mounting pressure. This proves that after temporarily sealing the flooded portions with the tiny wax balls, it is possible to fracture the oil-bearing portions with the sand-carrier fracturing technique, and thus increase oil recovery with little or no water increase. As Daqing Oilfield's oil layers are found in shallow depths, the fractures are generally horizontal, which proves that the fractures are composed of main horizontal fissures accompanied by small net-shaped cracks; the reticulated cracks are bound within the top and bottom intercalations located above and below the sandstones occupied by the main fissures.

(2) Selective Plugging Technique

Water can be plugged either with packers or chemicals. Packers are suitable for oil wells with single layers which are high in water content. The well strings consist of hydraulic compression packers and eccentric production distributors; before and after the plugging job, metering instruments are used to obtain data on the production volume, pressure and water contents of each pay zone. The high water content layer often causes the entire well's flow pressure to rise, and interferes with the production of low water content or water-free reservoirs. When a high water content layer displaces large quantities of fluid, it also prevents the flood water from entering low water content or water-free portions. In this case, it is possible to simultaneously increase the production of this particular well and other wells of the same well group by plugging up the high water content layer, which not only eliminates interferences between the layers, but also increase the flood volume. Generally, plugging should be executed when a layer's water content exceeds 80 percent; but if the well displaces large quantities of fluid, which affects water flooding in peripheral wells, it is best to plug the water-bearing well when the water content of the layer reaches 60 percent.

Today, there are two kinds of plugging agents for chemical plugging: calcium silicate and water glass. A packer is used to plug up the high water content layer, and the plugging agent is used to seal up the entire reservoir. But the layers are reached for production by acidizing or fracturing. Chemical plugging is suitable for wells with multiple high water content beds. The multiple high water content layers not only interfere with low water content layers and water-free beds, they also interfere with one another. Under such circumstances, it is impossible to correctly determine the breakthrough layers by conducting

water-finding tests on each separate layer; if there is no significant fall in the water content of the entire well after setting up the packer, it is necessary to first apply chemical plugging on those layers which are definitely high in water content. This is followed by water-finding tests on each separate layer until a significant fall in water content occurs. Due to the large number of plugged layers which are fairly thick to begin with, the production capacity of the entire well is generally low when the plugs are applied. Thus, in order to effectively reduce water and increase oil recovery, it is necessary to fracture the pay beds.

In some wells, partially stable thin intercalations are distributed within thick oil reservoirs; due to the tremendous difference in the water contents of the various sections, it is necessary to conduct plugging on an elaborate scale. Packers can be used to plug up the bottom water content portion, or seal up the entire layer first with chemical pluggers. Then, without resorting to sand-carrying fracturing, open the top low water content portion. So as long as the casing in the thin intercalation portion is firmly sealed from the outside with cement, fairly good results can be attained in plugging.

(3) Dual String Oil Recovery Technique

Dead oil zones may occur from plugging well arrays in the center of line drive patterns and certain wells in areal sweep patterns. To eliminate the interference of high water content layers with other layers, a fairly good way is to use dual strings to recover oil from high and low water content layers respectively. Now, most of Daqing Oilfield's dual string recovery wells are using the technique of exploiting two separate sections, which is suitable for oil wells with single high water content layers. There are also a small number of wells which use dual strings to recover oil from three or four sections, and the wells are distributed alternately among high water content layers and low water content layers.

The preceding measures for adjusting oil wells and tapping potential resources are only effective when used in conjunction with separate-layer water flooding. The overall objective is to increase the flooding volume, prolong the oilfield's high yield, stable yield period, and enhance the ultimate recovery rate. Due to the different stages of exploitation work, the conditions for applying the technologies also differ. Generally, during the water-free recovery and low-water recovery (water content less than 20 percent) stages, the quality of separate-layers flooding work ensures the high yield and stable yield production of the oilfield. During the medium water content (20-60 percent water) recovery stage, selective fracturing of the oil wells is done on the basis of separate layer water flooding; when the oil wells enter the high water content (over 60 percent) recovery stage, stable yield is achieved by plugging or dual string recovery. As adjustments and tapping are always carried out on portions of the oilfield, the stabilization of oil production depends on enhancing the recovery of certain portions of the oilfield to compensate for the decreasing well production in other portions of the field.

In each particular exploitation stage, the various resource tapping measures should not be used for one well only. It is necessary to depart from the heterogeneity of the oil water advance between the layers, on the planar surfaces and within the layers throughout the entire area. Thus, in Daqing Oilfield, it is required to measure the volume of water injected into the various layers each quarter, and, in

addition to quarterly inspection of reservoir pressure, it is also necessary to inspect the oil yield and water contents of each separate layer every other year with turbine flowmeters and water ratio metering devices. Based on the metering data, the horizontal surface distribution of petroleum in each principal reservoir is mapped out on charts. The charts indicate the heterogeneous features of inter-layer, planar and intraformational distribution of oil and water; and based on the charts, plans are formulated for making overall adjustments, regulating water distribution in each separate layer, and also for drawing up blueprints for oil-well selective fracturing and plugging. As a consequence, excellent recovery results are attained in the exploitation of the entire region. Following are examples of two exploitation regions which illustrate the effects of separate layer water flooding, overall adjustments and tapping potentialities.

The western portion of the central region covers 9 square kilometers with geological reserves amounting to 37.6 million tons. Altogether, there are 33 oil wells and 33 water injection wells. The area has two productive series under exploitation: Sa'ertu Reservoir and Putaohua Reservoir. Both reservoirs use line drive patterns in which the row spacing is 2,400 meters. Between rows of flood wells are three rows of production wells placed 500 meters apart, and the row spacing is 600 meters. Odd number wells recover oil from the lower portion of Putaohua Reservoir, and even number wells recover oil from the upper portion of Sa'ertu Reservoir. Flood recovery began in 1963, and entered full-hole sweep-out flooding stage in 1960-1964, during which water-cut rose at the rate of 7-8 percent for every 1 percent recovery of the geological reserves. The period 1965-1969 was the separate-layer flood recovery stage in which water-cut rose at the rate of 3 percent for every 1 percent recovery of the geological reserves. From 1970 to the present, separate layer flooding has been combined with overall adjustments and the tapping of potentialities; during this stage, the water-cut has risen at 1.1 percent for every 1 percent recovery of the geological reserves. Today, the recovery level is 30 percent, the combined water cut is 55 percent, and the oil recovery rate is maintained at 2 percent. Each well can produce 45 tons daily, while maintaining the level of the early stages of exploitation (Figures 8, 9).

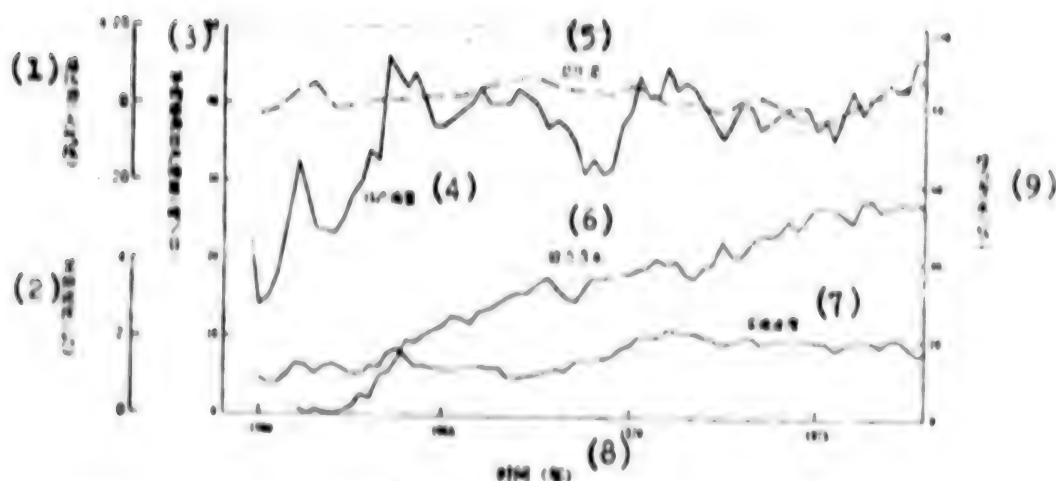


图 8 中区西部开采曲线
Figure 8 Recovery curves of the western portion of the central region.

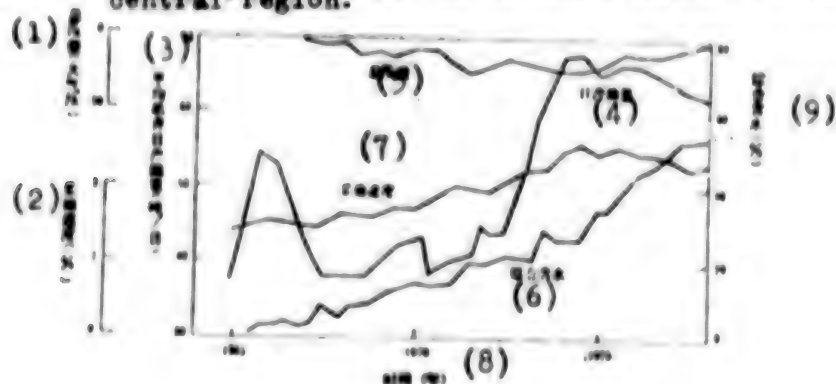


图 9 南二区开采曲线
Figure 9 Recovery curves of the second southern region.

- (1) total pressure difference (atmospheric pressure)
- (2) oil recovery rate (percent)
- (3) mean daily yield per well (ton/day)
- (4) daily production volume
- (5) total pressure difference
- (6) combined water-cut
- (7) oil recovery rate
- (8) time (year)
- (9) combined water-cut (percent)

In the second southern region, the Pu Group well pattern covers 23 square kilometers with 33,770,000 tons of geological reserves. Altogether, there are 32 flood wells and 40 oil recovery wells. The line drive flooding technique is used here; the cut spacing is 3 kilometers, and production wells are bored in three rows. In the first row, the row spacing is 1,000 meters; in the second row, the row spacing is 500 meters. The production wells are placed 500 meters apart and the flood wells are placed 300 meters apart. Flood recovery began in 1964, thus materializing early period separate-layer water flooding. The water-cut ascent was controlled

at approximately 2 percent for every 1 percent recovery of the geological reserves. At present, the recovery level is 28.3 percent. The combined water-cut is 54 percent. The annual recovery rate is 2.7 percent. Each well produces an average of 61 tons per year, which is 50 percent higher than the early stages of exploitation. The recovery level is also better than the western portion of the central region.

As the high/medium permeability layers gradually entered the high water content oil recovery stage, the recovery of low permeability layers became increasingly important. Besides widespread use of high pressure water injection to increase the flood volume in high/low permeability beds, several exploitation regions in Daqing Oilfield have already resorted to close-well patterns in low permeability layers especially to recover oil from low permeability layers and oil-bearing pelitic siltstone. In these areas, the low permeability layers' water absorption capacity and flooding efficiency were improved in no time. After restoring the pressure, the oil wells' production capacity also greatly increased, and all the wells likewise maintained flow-production status, and the oil recovery rate reached as high as approximately 20 tons per day. The next step is to come up with suitable plans for intensifying the patterns while keeping the number of close wells down to a minimum.

Besides underground adjustments in the oilfield, it is also necessary to increase the flood volume and contaminated water treatment to match the ever-increasing volume of water contents and oilfield production fluids. Moreover, in order to meet the oilfield requirements for maintaining high and stable yields, the water flooding and crude oil gathering line system should be adjusted, tapped, improved and expanded in stages.

In sum, by emphasizing specific conditions in the course of its development, Daqing Oilfield has attained fairly good results in solving technical problems which had been crucial to understanding and reforming the reservoirs. In the future, steps must be taken to further the in-depth study of reservoir heterogeneity as well as to improve the accuracy of metering each separate layer, and increase the flood volume in thick reservoirs. It is also imperative to enhance the production capacity in low permeability beds and solve such technical problems as how to discharge large volumes of fluids during the high water content oil recovery stage, so as to further enhance Daqing's exploitation work.

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CSO: 4006

CONSTRUCTION

REDUNDANT CONSTRUCTION PROJECTS IN NATION DECRIED

Beijing RENMIN RIBAO in Chinese 25 Aug 80 p 3

[Report: "Some Departments and Units Blindly Pursue Their Own Systems; Redundant Construction of Factories Causes Enormous Waste"]

[Text] Editor's note: Our country is still very poor, and every penny should be treasured. However, incorrect guiding ideology, coupled with poor planning, has caused some places to develop a situation in which each does things in his own way. Some pressing construction projects have received no investment, while much redundant construction has popped up, resulting in serious waste. The information [below] provided by the Chinese People's Construction Bank deserves great attention from concerned parties.

It has been learned from the Chinese People's Construction Bank that in checking projects under construction, construction banks in various places found that when several departments and units arrange for basic construction projects, they one-sidedly stress their own needs without regard for cooperation and coordination with others, without consideration of fully tapping the present production potential of one's own department, area, or unit, and blindly pursue their own "self-sufficient" systems. Consequently, there is redundancy everywhere and the extent of redundant construction remains very serious.

An aircraft repair hangar of a Bureau of Civil Aviation Plant, a Beijing Underground Railroad vehicle repair plant, the Zhangchun Motor Vehicle Plant No 2 Foundry, two cement products plants in Shenyang, two turbine engineering projects of a machinery department for package engineering equipment in Touping, Shenyang, and the Baoding Prospecting Machinery Plant--are all redundant. As investigated and ascertained by concerned parties, if only cooperation can be strengthened and present productive potentials explored, the construction of these projects either will prove unnecessary or can be minimized, saving over 100 million yuan in investment.

The Bureau of Civil Aviation is constructing an aircraft hangar at the capital airport that is almost 10,000 square meters in size, at an investment of 4.25 million yuan. It will be completed for use next year. However, the bureau has also arranged for a plant to build another new aircraft repair hangar that has an area of over 20,000 square meters. When such integrated facilities as a runway, an aircraft parking area, and a boiler room are added, a total investment of over 2 million yuan will be required. According to the findings of concerned parties, the aircraft

repair hangar at the capital's airport will be able to satisfy the needs of present aircraft repairs. The new aircraft repair hangar and integrated facilities are unnecessary, and this investment can be saved.

The Beijing Underground Railroad is building an underground railroad vehicle repair plant in Qinghe. According to the plans, total investment is over 2 million yuan, with an area of 319 mu, a construction area of over 70,000 square meters, and 300 staff members. Preparations to construct this plant began in 1974, and work began in 1978. By the end of last year, a cumulative total of 2.55 million yuan of the investment had been spent; it is estimated that when the project is finished, the actual investment required will be 30 million yuan. However, according to the findings of concerned departments made during the construction of the Beijing Underground Railroad, an underground railroad machinery repair and integrated plant (subordinate to the Railroad Guards) had already been built and was responsible for the tasks of examining and repairing underground railroad vehicles as well as construction machinery. Since this plant has changed its subordinate relationship, it no longer has these tasks. Production tasks in the past 2 years were inadequate and profits decreased by 85 percent. If the large repair workshop for the underground railroad is started up again and it continues its examining and repairing tasks for underground railroad vehicles and construction machinery, construction of the Beijing Underground Railroad vehicle repair plant can be halted and a large amount of investment can be saved.

The Zhangchun No 1 Motor Vehicle Manufacturing Plant is preparing to build a new No 2 Branch Foundry. Plans call for a total investment of 50 million yuan and an annual casting production capacity of 42,000 metric tons. According to findings, the No 1 Branch Foundry subordinate to the Zhangchun Motor Vehicle Plant has a capacity of 69,000 metric tons. Not only can it satisfy motor vehicle group assembly needs, but it has capacity to spare. Even if motor vehicle production is further expanded, by making some investment in technological transformation at the No 1 Branch Foundry, production requirements can still be satisfied without having to construct the No 2 Branch Foundry at all.

Two cement plants are being constructed facing each other on a road in Shenyang's Hengqu Ward. One is a large wall panel plant and the other is a cement components plant. These two plants require a total investment of over 20 million yuan. Their construction has been independent of each other, resulting in a redundant construction area of over 1,600 square meters and a redundant investment of 4.94 million yuan. The wall panel plant has already been under construction on and off for 7 years because of insufficient investment. When work began on the components plant last year, investment was also insufficient. If they were constructed jointly, resources could be pooled, resulting in early completion and use, savings of 4 or 5 million yuan in investment, over 300 metric tons of steel materials, over 900 metric tons of cement, and over 200 cubic meters of timber, plus a reduction of more than 120 staff members.

Measures to halt or effect joint construction are now being adopted toward some of these redundant construction projects, while others are waiting to be dealt with. Since the departments have proposed that early and resolute measures be taken to halt or to undertake joint construction immediately, in order to avoid creating greater waste.

9586

CSO: 4006

CONSTRUCTION

NEW HOUSING DESIGN IN BEIJING RECEIVES PRAISE

Beijing GUANGMING RIBAO in Chinese 6 Aug 80 p 1

[Report by Ma Yunong [7456 7183 6593]: "New Plan for an Economically Ideal Type of Housing Design Gains Popularity"]

[Text] A number of residents in Beijing Municipality will soon be able to move into an economically ideal type of apartment buildings. The design of this type of housing has a very great advantage. By decreasing the story height 20 centimeters, it can provide each household an expanded construction area of 2 square meters without having to increase housing construction costs.

On 7 July, the Beijing Municipal Construction Committee announced its decision to formally use the new plan of this type of multistory housing designed by the Beijing Architectural Design Institute as the common housing blueprint for 1980, and to put it to experimental use in Beijing. The announcement also demanded that in principle, a standard story height of 2.7 meters will henceforth be enforced in housing built in systems with concrete brick structures and large mould plates in Beijing.

Multistory housing in our country has an average story height of 2.9 meters. In summing up experiences at home and abroad last year, Design Office No 8 of the Beijing Architectural Design Institute proposed a new design, on the basis of a series of scientific research studies in housing design. The characteristics of the new proposal are that story height is suitable for reduction, and varying degrees of savings are possible in construction land utilization, investment, concrete, steel materials, clay bricks, and other materials. Thus, with the prerequisite of not increasing housing construction costs, it is possible to give each household an expanded 2 square meters of construction area. This kind of housing plan layout is more rational. Each household has its own living room, which can be used for dining, entertainment, and a temporary abode; effective living space is 5 to 10 percent higher than designs in general. Bathrooms are installed with toilet seats, small washbasins, and small fiberglass-reinforced plastic bathtubs (or shower facilities). Besides vegetable sinks, kitchens are installed with additional chopping tables, cabinets, hooks for cooking utensils, and mop basins. Lighting and ventilation have also undergone some improvement. To suit the needs of modern family life, the new plan also designs space for the installation of washing machines and freezers. In the past few months, a set of model apartments that reflect the result of this design have aroused the interest of personalities of various circles. Visitors come in an endless stream, numbering almost 10,000. This reporter has read many words of praise left behind by numerous visitors on suggestion forms at the model apartments.

The standard story height of multistory construction is a question much debated in architectural design circles. Having seen the model apartments of this new housing plan, some specialists have pointed out that the standard height of housing construction mainly reflects the area, fixtures, and internal decoration. Although housing standards in economically developed countries are high, their story height is but about 2.6 meters and the ceiling height is generally between 2.4 and 2.5 meters (not necessarily with ventilation facilities). In comparison, the standard story height of 2.9 meters throughout our country is obviously high. Even after it is reduced to 2.7 meters, the indoor ceiling height will still be 2.54 meters. After visiting the model apartments, many people feel that the worrisome and depressing problem of decreased story height has been solved.

As soon as the Ministry of Education and the People's Literary Publishing House and other units had learned that the new multistory housing plan had come into existence, they entrusted the Beijing Architectural Design Institute to do the design work. At present, a 3,785-square-meter residential building designed and built on this plan through the Ministry of Education has already been completed. This building has 66 apartments. There are 6 single-room units and 12 three-room units, with the remainder double-room units. Everyone has praised it, because the layout is more rational, usable space is larger than customary, and bathing facilities are available. According to the comrades of the Beijing Municipal Architectural Design Institute, the design of these two units is now being duplicated and used by many other units. On hearing the news, quite a few units from other parts of the country sent men and letters to seek purchase of the blueprints for the construction of this type of housing. As the design staff of this institute has indicated, this type of plan has problems that still need improvement and perfection. They are prepared to continue with research during the period of trial use, and to strive to design even more new housing plans that are better in richness and variety.

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CSO: 4006

CONSTRUCTION

SUGGESTIONS FOR SHANGHAI HOUSING CONSTRUCTION REPORTED

Shanghai WEN HUI BAO in Chinese 5 Jul 80 p 1

[Report by Sun Zhonglian [1327 0022 6647]: "Cadres of the Municipal Housing Main Corporation, Other Units, and Economic Theorists Make Recommendations for Accelerating Housing Construction in Shanghai"]

[Text] Housing construction is a major part of urban construction. How it can be accelerated in Shanghai is of great concern to all levels of municipal party organizations and the broad masses of people. This reporter has recently visited the Municipal Housing Main Corporation, the bureau of real property, and other concerned units. Many cadres, engineering technicians, and economic theorists have offered quite a few suggestions and ideas on problems such as Shanghai's system of housing construction, construction planning, and land requisition.

Implementation of Unified Management System Recommended

Ju Shijie [7263 0013 2638], assistant manager of the Municipal Housing Main Corporation, thinks that it is necessary to first make appropriate reforms in the housing construction management system in order to increase the pace of housing construction. Land requisition and the tearing down of buildings, surveying and designwork, construction, scientific research, and supply of materials are at present all done in an uncoordinated manner and without forming a unified whole. This is extremely unfavorable to housing construction work and can easily lead to each doing his own thing, lack of coordination, and disputes. He recommends reform of the system of contracts between two parties in present housing construction, giving all responsibilities for planning, geological survey, design, and construction to the Housing Main Corporation, unifying concerned units on the basis of economic benefits with mutual contracting, fulfilling economic responsibilities, allowing each other the freedom of choice, and promoting competition in order to obtain the best economic results. The Housing Main Corporation should be responsible for the whole course, from planning and design to the completion, delivery, and use of small housing areas, and should carry out package type of production. This will greatly reduce work links, increase efficiency, save manpower and materials, benefit the industrialization of housing construction and the commercialization of housing, and thus accelerate housing construction in Shanghai.

Provide Timely Help and Make Perfection Even More Perfect

Li Lizhong [2621 4539 0022], deputy chief of the municipal bureau of real property, believes that in the present extremely tight situation with housing resources, housing construction should emphasize building more housing rather than appearance. Especially with the remodeling of old buildings in the central areas of the city, if we arrange the spacing according to past housing practices and maintain a minimum distance of one to one between buildings, even after the completion of new housing it will usually be inadequate for settling displaced households. He feels that we should proceed from reality with the prerequisite of guaranteed lighting and ventilation, and suitably reduce the distance between buildings in order to increase the rate of land utilization. We can even increase the foundation depth of housing structures. At present, five-story housing has a foundation depth of about 9 meters. If it is increased by 1 meter, the construction area for each hectare of land can be increased by 800 square meters. If it is increased to 13 meters, each hectare can accommodate an additional 3,000 square meters of construction. In other words, on the same area of land, housing can be increased by about 20 percent. Transitional stages should be allowed for the reconstruction of unsafe buildings, which should not be treated mechanically by planning departments.

High-Rise Construction Unsuitable At Present

Qian Zuyan [6929 4371 7370], engineer of the Municipal Housing Construction Office, said that many comrades now suggest building more high-rise housing in Shanghai in order to solve some of the housing problems and to enliven the city's looks. Of course, construction of high-rise housing has the advantage of high land utilization, with each hectare constructing 24,000 square meters, 60 percent greater than five-story housing. However, the construction cycle of a 12-story high-rise at present takes twice as long. Construction would require 43 percent more steel, and the cost would be 54 percent higher. As the national economic capacity is limited, the masses in urgent need of housing should allow limited investment and materials to play a greater role. We should build more of the economical and practical five- or six-story housing. It is not practical to build high-rises. Besides, too many high-rise buildings might not necessarily be good looking for the city. Urban structures which have varying heights and are undulating and unevenly spaced are better looking.

Land Requisition Should Have Long-Term Planning

Chen Minzhi [7115 2404 0037], of the Shanghai College of Social Sciences, feels that an important factor in the slow housing construction in Shanghai is the lack of land for foundations. Judging from the reality of excessively high construction density and population density in Shanghai's urban areas, suburban land requisition is inevitable. He suggests that a realistic investigation and calculation should be conducted into the present condition of households that are facing housing problems in Shanghai, the minimum required and feasible amount of housing that can be constructed in 5 or 10 years, and the amount of land required. At the same time, proper plans should be made for the appropriate selection of unoccupied suburban land for housing construction, and all necessary preliminary work prior to construction should be done well. In this way, construction capacity will not be like the situation several years ago, when work was held up at the start of each year due to poor organization. Moreover, in this way the supply of construction materials, design work, and surveying will not be scheduled inefficiently, and construction speed will be greatly increased. When the housing problem is basically solved in a number of years, it will be possible to construct housing for displaced households and to transform the old city more rapidly.

CONSTRUCTION

STATE COMMISSION ISSUES CONSTRUCTION SAFETY CIRCULAR

OW160923 Beijing XINHUA Domestic Service in Chinese 0739 GMT 15 Oct 80

[Text] Beijing, 15 Oct (XINHUA)--The State Capital Construction Commission recently issued a "Circular on Conscientiously Doing a Good Job of Construction in Winter." The circular called on all localities, departments and construction units to earnestly learn from the "Bohai No 2" accident and to take effective measures to prevent occurrence of major accidents during construction in winter.

The "circular" called on all construction units first to do a good job in making necessary preparations for construction work in winter. Before the arrival of winter, the broad masses of workers and staff must receive ideological and technical education to overcome attitudes of negligence and of leaving things to chance during construction in winter. The various systems of responsibility must be consolidated and perfected, and the operation procedures and related regulations for winter construction must be strictly adhered to. A good job must also be done with regard to weather forecasting and temperature recording. Necessary equipment and materials for the prevention of damage from cold temperatures and freezing must be well prepared. Work on prevention of fire, poisoning and explosions must be strengthened.

Conscientious inspection and maintenance must be carried out for builders' temporary sheds, living quarters for staff and workers, warehouses, messhalls, and water and electric supply facilities. At the same time, we must also conscientiously work out and implement technical measures for winter construction. Technical and organizational measures must be formulated for all winter construction projects by integrating the special characteristics of each project with its construction schedule. Such measures must be observed by every construction unit and by all workers. Special and effective measures must be adopted to insure complete safety in regard to those projects and sections in which safety is easily overlooked and accidents easily happen, as well as in those sections in which new technologies or new techniques are involved.

Regarding those construction projects that must be suspended or postponed, we must insure that the most important construction work is completed before the arrival of winter, and we must also do a good job in maintenance and prevention of damage from freezing. Moreover, we must conduct a comprehensive inspection and make arrangements for reliable safety measures on water supply lines, sewers,

large concrete tanks and storage rooms on which construction is completed. Similar inspection and arrangements must also be made for boilers, towers, jars, troughs and other equipment or vessels that have undergone pressure tests but are not ready for operation before the winter freeze.

The "circular" points out: In the event of major accidents in the future, the higher authorities must be speedily informed and immediate measures must be taken for properly handling the accidents. Responsibility must be pinned on those involved and they must be seriously handled.

CSO: 4006

FOREIGN TRADE

CHINA OCEAN SHIPPING ORDERS FOUR BULK CARRIERS FROM DENMARK

Copenhagen BERLINGSKE TIDENDE in Danish 2 Oct 80 p 13

[Text] Burmeister & Wain's Shipyard Inc has entered into a contract with China's state-owned shipping company, China Ocean Shipping, for the delivery of four bulk carriers, of approximately 64,000 tons each. It is a question of an order for approximately 800 million kroner. To the shipyard on the Refshale Island, the order means that employment has been secured till some time in 1983.

The big order comes at a time when shipbuilders within the EC have asked the Economic Commission for Europe to attempt to persuade Japan to cut down on its new construction activities. For Japanese shipbuilders have got nearly 60 percent of the total shipping tonnage ordered this year from shipyards throughout the world. Expressed in precise terms, Japanese shipyards have got 59.8 percent of the total volume of orders as against 48.4 percent last year, while the share of the EC countries has dropped from 11.6 percent to 8.5 percent.

Additional Orders Expected

The B & W shipbuilding company states at the same time that additional contracts for ships of the type which are just able to pass through the Panama Canal are being negotiated, including a contract for two bulk carriers for a shipping company in Hong Kong. The B & W shipbuilding company already has five ships on order of this type and has thus, in less than 12 months, landed export orders for approximately 1.7 billion kroner. The first delivery to the Wheelock Marden shipping company in Hong Kong will take place by the turn of the year. This will be followed by a second delivery to the same owners in 1981, together with three sister ships to the Norwegian owners Thorva Klaveness. The four ships for China will be delivered in 1982 and 1983.

Saves Oil

The background to the great interest in these very bulk carriers is, of course, the growing need for grain and coal transports. B & W has

previously, in the sixties and seventies, built a series of a total of 37 bulk carriers.

Since then, the type built by B & W has been further developed specially with a view to economizing on the costly bunker oil. The shipbuilders themselves claim that their type of bulk carrier can save 15-20 percent of the fuel consumption compared with more conventional bulk carriers of the same size. This is due partly to an improved design of the hull after numerous experiments in the model tank at the Ship Research Laboratory at Hjørtelær, but also to the B & W long-stroke diesel engine. It would have a fuel consumption of less than 40 tons in 24 hours at an average speed of 15 knots.

The bulk carriers are being built for the Norwegian Veritas class and are 225 meters long, 32 meters wide and have a draught of 13 meters.

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CSO: 3106

FOREIGN TRADE

BELJING CONTINUES TO INVIGORATE ITS FOREIGN TRADE

Beijing BELJING RIBAO in Chinese 30 Aug 80 p 1

[Article: "The City's Lively Foreign Trade Continues to Develop"]

[Text] This city's lively foreign trade has been further developed and increased. This year, 84 contracts have already been signed with foreign businessmen, including 60 for import of materials for processing and import of parts for assembly, 19 for compensation trade, and five for repair services and technical cooperation. The income from processing work and the compensation trade form are being used to bring in 300 kinds of equipment and instruments. The number of agreements has increased 3.5 times over last year, and the total value is up 7 times over last year.

This year, as foreign trade work has steadily developed, many enterprise management comrades have become more and more flexible in their thinking, have increased their commercial abilities and have found more and more possibilities. By means of compensation trade and the like, they have actively linked the attracting of technology with enterprise technical advancement, and have raised their enterprises' production technology levels.

As regards the level of processes and technology, much of the technology and equipment brought in by this city is advanced 1970's level. When these agreements are implemented, the existing enterprises' renovation and transformation will be further accelerated, and the technological level and management level of these trades will be raised considerably. The Office of Electronic Equipment has signed 13 agreements on import of materials for processing and import of parts for assembly with plants in such places as Japan and Hong Kong, dealing with radio-recorders, tape recorders, color televisions, 12-inch black-and-white televisions, pocket computers and loudspeakers. The processing income which they earn will bring in more than 140 kinds of key measurement and testing instruments and more than 1,200 tools of various types which this country lacks and urgently needs for production. These instruments and tools have been used to improve 6 assembly lines for black-and-white televisions, console-type radio-tape recorders, color televisions, tape recorders, and pocket calculators and have laid a fine foundation for increasing the output of household electronic equipment sorely needed on the market.

In terms of the direction of development, most of the agreements that have been signed are based on the capital's location and characteristics and are centered on high-grade, precision and advanced products of the light textile and electronics industries, along with some pollution control items. In the first half of this

year, various units belonging to the city's Second Bureau of Light Industry have contacted more than 80 factory representatives from eight countries and are carrying on 55 separate negotiations; 15 contracts and agreements have already been signed. The 16 products covered by these new agreements include aluminum frying pans, electric cooking utensils, music boxes, rubber-backed chemical fiber carpets, and women's fashions, which will give further impetus to the existing enterprises' production capabilities. The 17-88 polyvinyl alcohol produced by the organic plants is a chemical product of extensive uses needed by light industry, and the textile, printing and other industries. As the light textile industry develops, its needs are steadily increasing, and cannot be met by the domestic market, while the international market will sell as much as it has available. By compensation trade the organic chemistry plants have brought in eight equipment units, which together with associated domestic equipment can be used in a set of new equipment with an annual output of 1,000 tons of 17-88 polyvinyl alcohol. The 8 imported pieces of equipment have already been received. The plants are in the process of organizing technical personnel and workers to install them and are striving to get them into production by the end of the year. A set of electric furnace dust removal equipment obtained by the Beijing Steel Plant from Sweden in compensatory trade will make it possible to solve a long-standing pollution problem.

Extensive development of foreign trade can also make it possible to process foreign-supplied raw materials for production of export items. The Peking Canvas Cloth Plant has signed a contract with the Hong Kong Li Sen Company to take on raw materials processing tasks for it, thus increasing the supply of raw materials, so that its production capabilities have been more thoroughly brought into play. Compared with the equivalent period last year, in the first half of this year output value has increased by 12.17 percent and profits paid to higher levels have increased by 9.1 percent.

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CSO: 4006

FOREIGN TRADE

ZHEJIANG FINDS INTERNATIONAL MARKETS FOR ITS MACHINE PRODUCTS

Hangzhou ZHEJIANG RIBAO in Chinese 1 Sep 80 p 1

[Article: "This Country's Machine Products Go to Foreign Markets"]

[Text] The business department of this province's machinery and equipment import and export company recently received a letter from a Canadian trade representative placing an order for 200 Shuangge Brand chain blocks from the Zhejiang No 5 Machine Plant and requesting to order an additional 500 next year. The representative had learned from the World Trade Directory that China supplies this kind of chain block. It is understood that since this March, when it began to do its own foreign trade work, the province's machinery and equipment import and export company, such letters and telegrams containing orders or involving trade talks have been averaging 2-3 a day, with a maximum of 10 a day, and 21 foreign trade delegations including more than 60 persons have been received. It is unprecedented that Zhejiang's machine products should attract such interest on the international market.

"High product quality is the passport to the international market," is the experience of the staff and workers of this province's machine industry. The Xihu brand upright drill produced by the Hangzhou Xihu Drill Press Plant is a traditional machine product export of this province, which has long been well known in the Southeast Asian market. But during the time that the "gang of four" held sway, product quality dropped and it lost its market in many countries. Once the "gang of four" was smashed, this plant made a determined effort to improve product quality, and again established the product's reputation, so that old customers continued to place orders and many new customers were eager to buy it. The plant's export quantity last year was 28.5 percent over the preceding year, while this year it is up 40 percent over last year. As a result of their improved quality, our province's machine products have raised their reputation on the international market. The M7130 surface grinding machine produced by the Hangzhou Machine Tool Plant was improved in 14 areas in an effort to refine it still further, and the product's intrinsic quality and capabilities were clearly improved, so that it received extensive good evaluations in foreign trade. At this year's spring Canton Trade Fair, an American commercial representative asked specifically for this grinding machine produced by the Hangzhou Machine Tool Plant. Currently this product is not only selling well in Hong Kong and Amoy, and Southeast Asia, but is also being sent to far-away European and American markets. This year's export quantity is more than double last year's.

In order to make machine products find a ready outlet on the international market, this province's machine industry gives full attention to the operating conditions, production practices and meteorological environment to which the products it sells are subjected and is continuously improving the design of older products. The Philippine climate is rather humid, and under these conditions insulating parts inside generators very easily mildew. The Hangzhou Generating Equipment Plant, which produces generators for export, has organized a group to carry on research, improve product design and enhance anti-moisture, anti-mildew features. Philippine trade representatives are very pleased with this, and recently they signed a generator production technology transfer agreement with the plant. Foreign users generally use English-system units, so they have changed the metric graduations to English units. The foreign users wish to use fork lifts for bay storage of warehouse commodities, so they have devised 5 different fork lift devices in such a way that one fork lift has many uses. The Feige brand chain block produced by the Wulin Machine Plant in Hangzhou originally could only be used for vertical hoisting, but when they realized the the Australians are accustomed to slant hoisting, they immediately began to study design improvements so that the chain blocks could also be used for slant hoisting.

In this province's machine industry, workers and staff have also studied new international market needs via various channels and are actively producing many new products required by foreign purchasers. The Dongyang Hydraulic Equipment Plant learned from relevant quarters that country vacation houses are numerous abroad and that many are near mountain lakes. In view of this circumstance they organized a group to develop a 5-kW oblique-impact hydraulic generator. This miniature generator set is of simple design with excellent characteristics, takes up a small area, can generate electricity without using a very large quantity of water, and is very suitable for rural vacation home use. The head of the Haimen Machine Tool plant heard a foreign trade representative at last year's fall Canton Trade Fair say: "I have searched everywhere at the fair and cannot find a simple upright drill." Unbeknownst to the speaker, his words were taken to heart. The plant immediately found out from the relevant quarters what type of upright drill the trade representative was referring to and what its uses were, and when the plant official returned to the plant he immediately organized a group for experimental development of one. When this new product was taken to this year's spring Canton Trade Fair, a foreign trade representative saw it before it had even been unwrapped, and immediately ordered 10. According to incomplete statistics, to date the provincial machinery system has more than 24 newly-added export products in production.

It is because the adaptability of the products on foreign markets has been increased that they have greatly increased their market, business is steadily expanding. As of the end of this July, the total value of export products for which the provincial machine building system had signed contracts with foreign trade representatives was already 20 percent of the total export amount for the whole of last year.

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FOREIGN TRADE

MEASURES TO HELP MOUNTAIN AREAS EXPAND EXPORTS ADOPTED

Hangzhou ZHEJIANG RIBAO in Chinese 17 Sep 80 p 1

[Article: "Helping Communes and Brigades in Mountainous Areas to Expand Their Output of Export Products"]

[Text] Editors' Note: The foreign trade departments' assistance to construction in mountain areas aims primarily at utilizing mountain districts' resources to produce export products, thereby using foreign trade channels to stimulate the districts' economic development, with the result that the peasants' income in such regions is increased. This is also an important way in which the foreign trade departments can expand sources of export products. Currently, the income of peasants in many mountain areas in this province is rather low, and their economy is not very energetic. Their cadres and commune members urgently hope that the relevant department will show them ways to grow richer, so that the mountain regions will quickly become better off. Following a survey, the provincial foreign trade office has made new arrangements for stimulating construction in mountainous regions; their method is worth study by all localities.

On the basis of the provincial committee's plan for accelerating construction in mountainous districts, the provincial foreign trade office's leadership comrades have led a group which went to the mountain regions to make a survey, and on the basis of the needs of the international market and the actual situation in our province's mountainous regions they have made new arrangements regarding ways of utilizing the mountainous regions' resources to develop the output of export products and aid development in the mountain areas.

/Actively assisting the communes and brigades to use local resources in expanding their output of processed commodities, focusing on bamboo, wood and grasses./ Indocalamus, cogon grass, alpine rushes, barley straw and the like are excellent materials for export items made of grasses. By means of good design, continuous innovation and expanded foreign sales, within a year they can be made into top selling items worth more than 100 million yuan. Thus the processing proceeds made available to rural commune members in a year could reach 50 million yuan. Provided that the assignments for sale of mao bamboo to the state are completed and that the amount of mao bamboo in storage is increased, we will actively assist communes and brigades in developing bamboo products for export. At the same time,

thorough utilization of mountain wood resources and development of a large variety of processed items for export from minor raw materials is also an important way of expanding mountain regions' output of export items. It is important in this connection to make a sufficient effort to train a technical cadre and to take the time to create new designs so as to create products of a unique character.

/The mountain regions are rich in pasture lands, and such slaughter livestock as cattle, sheep and rabbits may be raised in large quantities./ An energetic effort should be made to develop good beef cattle for export. Good imported beef cattle varieties should be bred with indigenous mother cows to produce good varieties; this has been shown to be possible in practice. The raising of goats has also great promise for development. Cured goat skins, goat-gut sausage casings and young goat skins are much needed for export, and bring a good price. Rabbit raising is not yet widespread in mountainous regions, and good rabbit varieties are not yet numerous. More good fur-bearing rabbit varieties should be introduced and bred, and efforts should be made to make them into fast-selling products worth more than 100 million yuan within 2 or 3 years. The local textile industries can be expanded and converted to concentration on rabbit fur for export. At the same time, rabbit production for meat should be expanded in systematic fashion, and comprehensive utilization developed with good rabbit skin processing.

/Actively develop mineral export products./ Our province's underground resources are numerous, including rich reserves of minor nonferrous metals, Fei Shi [1468 4258], marble, quartz, granite and the like. The foreign trade departments will continue to support concentration on development of mineral products for export by some regions. Currently there is a pressing need to explore the resource situation so as to develop resources selectively and systematically.

/Make full use of women's labor in rural regions and develop labor-intensive products such as embroidery./ Drawn work is one of our province's fast-selling export items, with great promise for expansion. This year the processing income distributed in the countryside will exceed 60 million yuan. In the future we must gradually solve the following problems: (1) reasonable geographical distribution and planned expansion into mountain regions; (2) strengthening of the technical and design cadre so as to effect continuous product innovation; (3) conscientious implementation of the rural economic policy, and active support of legitimate family sideline enterprises with the increase in income going to the individual commune members; (4) gradual arrangement of independent production of the thread and cloth used in drawn work within the province so as to increase initiative.

/Continue planned creation of a group of agricultural sideline export products base and export canning materials base./ In the future we propose to adopt three methods: (1) joint operations by the foreign trade department and the localities, with the products sold directly by the foreign trade departments; (2) independent operations by the localities with the foreign trade departments providing the necessary financial and material assistance; (3) creation of export canning materials bases centered on canneries; such method as joint operations by the cannery and the brigade with distribution of a proportion of profits may be adopted.

As regards farming, the foreign trade departments will help mountain districts develop valuable medicinals, spices and oils, Dalmatian chrysanthemum and the like on the basis of specific local conditions. Such fruit delicacies as loquats, honey pears, plums and the like, as well as sweet fruit such as southern dates and jujubes, can also be actively developed.

TRANSPORTATION

QINGHAI PEOPLE'S CONGRESS DEPUTIES DISCUSS BRIDGE COLLAPSE

SK170702 Xining Qinghai Provincial Service in Mandarin 1100 GMT 15 Oct 80

[Summary] This afternoon, Xining municipal deputies to the Third Session of the Fifth Provincial People's Congress addressed an inquiry on the serious Jianca Bridge collapse accident.

(Yuan Wenjun), director of the Provincial Communications Bureau, answered questions raised by the deputies. He said that construction on the Jianca Bridge, 174.62 meters long, 20 meters high, 8.5 meters wide and 100 meters in span, was initiated in May 1978. On 9 September 1979 all the arches were joined.

At 1043 on 17 September, a serious collapse occurred, and 19 persons died. Two others were seriously injured. The economic loss incurred was about 300,000 yuan.

"Discussing the reasons for the collapse (Yuan Wenjun) said: As far as the leadership is concerned, the basic reasons [for the incident] are a lack of a strict scientific approach and a violation of construction procedures. In addition, there were many technical problems in design and construction. The bridge arch was originally designed to be composed of five parts, but it was later changed to be composed of seven parts. Following only one meeting--and without a blueprint--it was again changed to be composed of nine parts. The reason given was that the hoisting equipment was not adequate. The fact that technology is a science and should be respected was ignored.

"In addition, we did not have professional knowledge and were very bureaucratic. Although a responsible person of our bureau visited the construction site to inspect the work, he visited on very few times and discussed only paying attention to safety and quality without giving specific instructions on ways to improve quality and pay attention to safety.

"(Yuan Wenjun) said: Following the accident, we submitted six reports to the provincial people's government to give a detailed account of the reasons for the accident and why it happened in an effort to decide as quickly as possible who should be held responsible and draw lessons from it. However, since there were arguments on technical problems involving the accident, no unanimous conclusion has been reached. Responsible comrades of the provincial government have paid close attention to this accident. We believe that it will be handled properly in the near future.

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